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GEOGRAPHICAL HANDBOOK SERIES

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GREECE

VOLUME II

ECONOMIC GEOGRAPHY, PORTS AND COMMUNICATIONS

October 1944

NAVAL INTELLIGENCE DIVISION

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PREFACE

In 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand, it has become apparent that something more is needed to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities, and working at sub-centres established at Oxford and Cambridge. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed first to provide, for the use of Commanding Officers, information in a

comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, etc.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force and other Government Departments (many of whom have given great assistance in the production of the series) will find these Handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY
Director of Naval Intelligence
1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been prepared for the Naval Intelligence Division at the Cambridge sub-centre (General Editor, Dr H. C. Darby). It has been edited and largely written by Mr J. R. James and Mr H. A. P. Jensen, with contributions from Mr S. H. Beaver, Dr V. Capernaros, Mr W. L. Cuttle, Mr B. N. Darbyshire, Mr D. W. Fryer and Professor A. G. Ogilvie. The maps and diagrams have been drawn by Mr D. J. Bennett, Miss K S. A. Froggatt, Miss F. Hands and Mrs Marion Plant.

E. G. N. RUSHBROOKE
Director of Naval Intelligence

October 1944

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Major Ports of the Islands Kérkira (Corfu); Iráklion (Candia); Síros (Ermoúpolis); Khaniá (Canea); Mitilíni; Khíos; Vathí (Sámos)

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Chapter I

THE GROWTH AND DISTRIBUTION OF POPULATION

General Features

Distribution of Population The Dividing Mountains, Western Greece; Central Greece, Eastern Greece, North-eastern Greece, The Pelopónnisos; The Ionian Islands, The Thracian Islands, The Northern Sporádhes; The Kikládhes (Cyclades); The Islands of the Eastern Aegean; Krítı (Crete)

The Growth of Population. Territorial Expansion, Refugee Movements; Emigration, The Balance of Births and Deaths; Age Groups, The Death-Rate, The Birth-Rate, Fertility and Reproduction Rates

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General Features

The population of Greece at the census of October 1940* was 7,336,000; this is rather less than the population of Greater London and almost the same as that for Sweden, Austria and Portugal. Among the neighbouring countries of south-eastern Europe Greece is easily surpassed by Roumania and Jugoslavia, but almost equals the combined populations of Bulgaria and Albania.

Estimates of Population on 31 *December* 1938

	Population	Area in sq miles	Density per sq. mile	Density per sq km
Roumania	19,852,000	114,000	173	67
Jugoslavia	15,490,000	96,000	164	63
Greece	7,108,000	50,000	140	55
Bulgaria	6,273,000	40,000	160	61
Albania	1,057,000	11,000	97	38

Source *Statistical Year Book of the League of Nations*, 1938–9, p 18 (Geneva, 1939), and *ibid*, 1939–40, pp 17–18

* Detailed results of this census are not yet available and the analyses of population distribution and vital statistics have therefore been based on the Greek census of May 1928, and on subsequent estimates

Greece is the least densely peopled of the Balkan countries, except for Albania. This is due mainly to the fact that over three-fifths of the effective working population are engaged in agriculture and stock rearing, and only one-sixth of the land is under cultivation.

According to the census of 1928 the occupational distribution of the workers was as follows:

Category	Totals	Percentages
Agriculture	1,293,398	53 56
Stock rearing and hunting	167,302	6 93
Fishing	14,941	0 62
Mining and quarrying	6,340	0 26
Industry	429,831	17 80
*Transport and communications	106,758	4 42
Banking, broking, etc	22,937	0 95
Commerce	185,560	7 68
Personal service	57,570	2·38
Liberal professions	85,969	3 56
Public service	44,472	1 84
Total gainfully employed	2,415,078	100·00
Total population	6,204,684	

* Including 34,000 sailors.

Based on 1928 census returns from *Annuaire statistique de la Grèce*, 1938, p. 56 (Athènes, 1939).

Industrial development was slight until 1923, and there are still no great manufacturing centres as in western European countries. But the growth of small-scale industries in the Athens-Piraiévs district is slowly changing the balance between agricultural and industrial employment (see p. 105). The proportion of workers engaged in fishing (less than 1%) is exceptionally low when one considers that one-fifth of all the Greeks are islanders and that the mainland coasts are over 2,500 miles in length Even the mercantile marine, which is so important in the economy of Greece, employs less than 2% of the working population.

The dependence on agriculture is reflected by the relative importance of rural settlements in Greece The table on page 3 shows by actual numbers and percentages the population in different categories of settlements between 1879 and 1928.

The population has tended to concentrate more and more into towns with over 5,000 inhabitants, and especially into the large cities such as Athens, Piraiévs and Thessaloníki. In 1879 the population of settlements with less than 5,000 inhabitants represented 82% of

The Distribution of Population in Greece, 1879–1928, According to Size of Settlement

Settlements (No of inhabitants)	1879		1889		1896		1907		1920		1928	
	Pop	%	Pop	%	Pop	%	Pop	%	Pop	%	Pop.	%
Over 5,000	292,997	18	464,658	21	525,866	22	627,973	24	1,336,371	27	2,064,696	33
2,000–5,000	161,707	10	189,504	9	235,471	9	242,236	9	486,383	10	• 571,735	9
Under 2,000	1,199,063	72	1,533,046	70	1,672,469	69	1,761,743	67	3,194,135	63	3,568,253	58
Total	1,653,767	100	2,187,208	100	2,433,806	100	2,631,952	100	5,016,889	100	6,204,684	100

Source *Annuaire statistique de la Grèce*, 1932, pp 47–8 (Athènes, 1933)
In making comparisons between one census year and another, it must be remembered that Greece acquired new territory in 1881, 1913 and 1920 (see p. 23 and the table on p 39) Fourteen of the twenty largest towns in Greece are in these new provinces, a factor which is partly responsible for the increase in the percentage of the total population living in settlements with over 5,000 inhabitants.

the total. In the greatly expanded Greece of 1928 it was only 67%. The large number of people living in villages and small country towns remains the dominant feature of the distribution of population.

Distribution of Population

The plains of Greece cover less than one-third of the mainland, but they support more than half of the population There is not, however, a uniform distribution of population on the lowlands. Differences

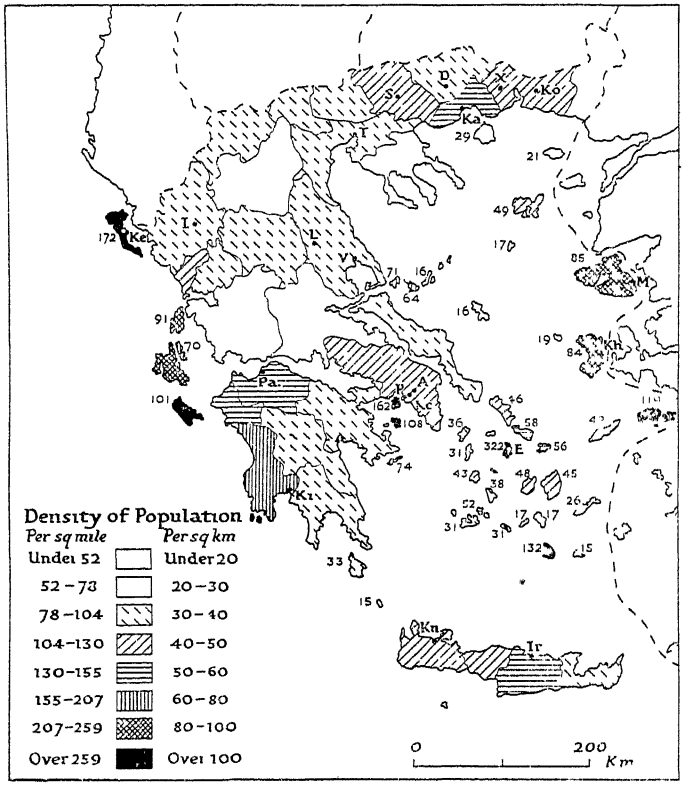

Fig 1 The distribution of population in Greece by *nomoi*

Based on the census returns for 1928 in *Annuaire statistique de la Grèce*, 1931, pp. 23–5 (Athènes, 1932)

The populations of Athens, Piraiévs and Thessaloníki have been omitted in calculating the densities of their respective *nomoi*. The figures show the density of population in the islands Towns which had over 20,000 inhabitants in 1928 are indicated as follows A. Athens, D Dráma; E Ermoúpolis (Síros), I Ioánnina; Ir. Iráklion, Ka Kaválla, Kc Kallithéa, Ke Kérkira, Kh Khíos, Ki Kalámai, Kn. Khaniá, Ko Komotiní, L Lárisa, M Mitilíni, P Piraiévs, Pa. Pátrai, S Sérrai; T. Thessaloníki, V Vólos, X Xánthi.

are caused by such factors as proximity of large urban centres, case of communications, incidence of malaria, and, most important of all, the type of agriculture practised. Thus, wherever there is a concentration upon commercial crops, as for example on tobacco in Dráma, currants in Ilía, or cotton in the Sperkhiós valley, the density of population rises to over 250 per sq. mile Where there are no specially intensive forms of agriculture, as on the high plains of Kozáni in western Makedhonía, the average density falls to about 125 per sq. mile.

The mountains cover more than two-thirds of the mainland and are the homes of some 40% of the population. There are no large towns, but the land supports a meagre population in widely separated villages. Few areas are completely uninhabited, for there is usually food for sheep and goats, or material for the woodman and the charcoal burner. During the past century there has been a progressive depopulation of the mountains of southern Europe. This movement has not left Greece unaffected, although it probably began later here than in other countries. A steady flow of people, for example, has left the highlands of Arkadhía for the plains of Ilía. On the other hand, the mountaineers of Taïyetos have stubbornly remained on a land that can only offer a low standard of living, and the density of population in the Máni peninsula is still well over 100 to the sq. mile.

The islands have a total population of over a million inhabitants and are more densely peopled than the mainland. On many of the larger ones there is intensive agriculture, and the inhabitants of the smaller ones have a strong local patriotism which makes them unwilling to emigrate. Some islands are specially favoured by their location, such as Síros, the distributing centre for the Aegean; others are rich in minerals (e.g. Thíra and Náxos), while others have some special characteristic, such as Aíyina with its sponge industry, Salamís with the naval dockyard, and Póros with its many hotels for summer visitors (Plate 2).

The distribution of population can best be considered in terms of the major physical regions of Greece (Fig. 2) which have already been described in Chapter I, vol. I, of this Handbook. These are:

(*A*) The Dividing Mountains
(*B*) Western Greece
(*C*) Central Greece
(*D*) Eastern Greece
(*E*) North-eastern Greece
(*F*) The Pelopónnisos

The principal island groups are:

The Ionian Islands
The Thracian Islands
The Northern Sporádhes
The Kikládhes (Cyclades)
The Islands of the Eastern Aegean
Kríti (Crete)

A. *The Dividing Mountains*

The Píndhos mountains and their extension northwards to the high Albanian frontier and southwards to the Gulf of Kórinthos form the largest area of sparse population in Greece. There is little cultivation, but the upland pastures are widely grazed during the summer months by sheep and goats from the Thessalian lowlands and from the plains of Attikí. Here, among the Vlachs, the traditional mode of pastoral life has been more fully preserved than anywhere in the Balkans.

The location and size of the few permanent settlements in the mountains is closely related to water supply. Thus, the villages tend to be widely separated and large on the dry porous limestone, while on impermeable rocks they are usually closer together and smaller. Occasionally, where springs emerge from the foot of the limestone ridges there is a long line of villages. At lower altitudes, small towns lie in almost inaccessible river valleys, or on the edge of fertile, but unhealthy, depressions.

The only large towns are those guarding the passes across the mountains. They have become the regional capitals and are often the centres for small domestic industries. In the north is Kónitsa on the right bank of the Aóös before the river flows into Albania. Métsovon, above an almost sunless pass, has a population of only 2,156, and guards the motor road from Ioánnina to Kalabáka. Farther south is Karpenísion, with less than 3,000 inhabitants, but the chief town of the Aitolian mountains.

B. *Western Greece*

Covering more than 7% of the area of Greece, the province of Ípiros had only 363,000 inhabitants at the end of 1938, or barely 5% of the total population. The low densities of Thesprótia, with 100 people to the sq. mile, and of Ioánnina with only 80, reflect the barren nature of northern Ípiros. The distribution of rural population is far from even, and one of the most striking features is the absence of villages from the alluvial plains. On the other hand, a

fairly large number of villages lie just above the plains, where abundant springs emerge from limestone, and where the dangers of floods and malaria are small. There are also a number of flat-floored

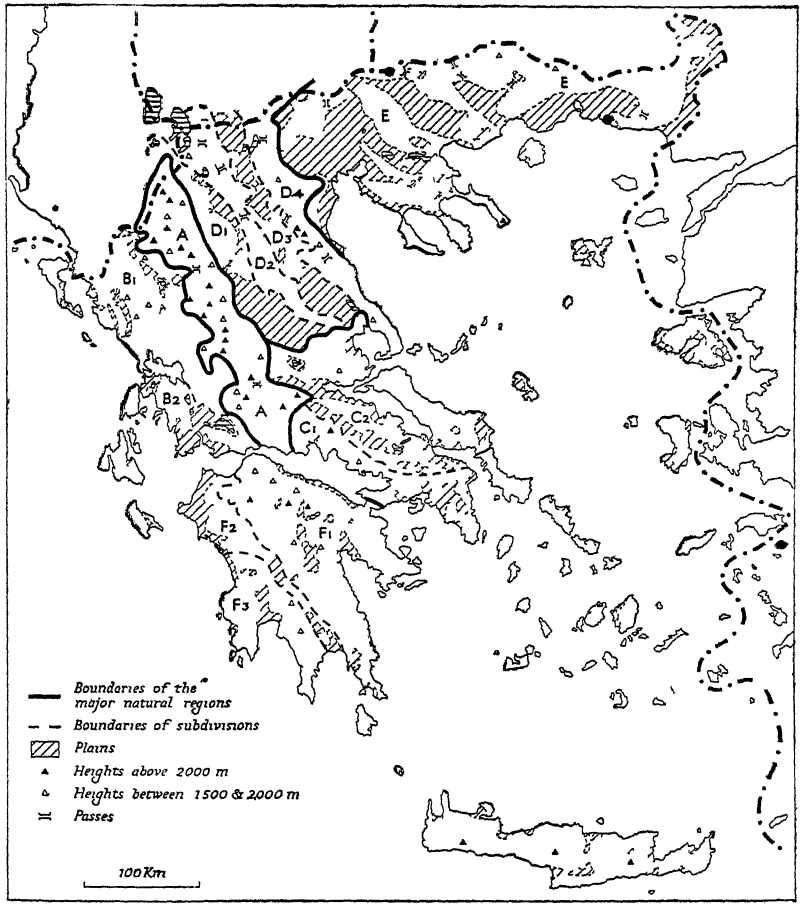

Fig 2 The major physical regions of Greece

The block letters indicate the areas into which the description in the text of the distribution of population on the mainland of Greece is divided (see p. 5).

depressions without superficial drainage on which the market towns of northern Ípiros have developed. The largest is the basin of Ioánnina, with its regional capital of over 20,000 inhabitants (see p. 383); next in importance is the basin of Margarítion, but Margarítion itself is little more than a village. The density of population

tends to be slightly higher on the coastal belt, where the tiny ports of Sayiádha, Igoumenítsa and Párga (Plate 4) are engaged in coastwise traffic.

Southern Ípiros, except for the mountainous belt of eastern Árta, is much more heavily populated than the north. The broad plain of Árta, stretching west across southern Préveza, has been drained and is intensively cultivated. Fruits, especially oranges, grains, cotton and some rice are grown, and except for the marshy and uninhabited shores of the Gulf of Amvrakía, the whole of the plain has an average density of over 260 people per sq. mile. Yet, with the exceptions of Préveza (see p 279) and of Árta (7,468), a route centre and market town, there are no urban settlements.

Akarnanía and western Aitolía together form the southern part of western Greece. They have an average population density of 80 per sq. mile, but the regional variations in so small an area are remarkable, ranging from the unpopulated flood plains of the lower Akhelóös to the intensively cultivated country east and west of Lake Trikhonís. The only large towns are Agrínion and Mesolóngion (see p. 302), but there are numerous small ports such as Vónitsa, Pálairos, Astakós and Krionéri. Agrínion, with 14,562 inhabitants, is a railway terminus that has doubled its population in the last fifty years, and has also become a centre for tobacco growing and embroidery.

C. *Central Greece*

From the southern Píndhos mountains a belt of high and arid limestone country stretches south-eastwards to the peninsula of Attikí. It is a relatively empty region, with a density of population in the Parnassós-Elikón district of only 28 per sq. mile, while in the Kithairón and Párnis hills to the east it falls to 7 per sq. mile. Even where it approaches the Gulf of Kórinthos and the Saronic Gulf it is bare of settlements, with two important exceptions. The more westerly of these is the olive-covered vale of Ámfissa, with 325 people to the sq. mile. The chief towns are Ámfissa itself, and the small ports of Itéa and Galaxídhion. The second exception is the Mégara lowlands, also devoted to fruit-growing, and supporting about 200 people to the sq. mile.

Excluding the crystalline mountains of Imittós and Penídelikón, the peninsula of Attikí is the most densely peopled region in Greece. Favoured by the recent development of industry, by the abundant labour supplies of refugees from Asia Minor, by the administrative importance of Athens and by the excellent port facilities of Piraiévs,

there has been an enormous growth of population in the last twenty years (see p. 378). The undulating plain of Mesóyia, with its rich red soils given over to barley, wheat, fruit and vegetables, supported 250 people to the sq. mile at the time of the 1928 census. In the south-eastern tip of the peninsula is the mining district of Lávrion, with a population of 430 to the sq. mile. The islands of the Saronic Gulf also are especially favoured: Póros (800 per sq. mile) is a summer resort; Aíyina (280) has a garrison as well as a pottery and sponge-fishing industry; and on Salamís (420) is the largest naval dockyard in the country (see p. 233).

To the north of the long line of limestone mountains the varied relief and vegetation of Fthiótis-Fokís and Voiotía cause considerable diversity of population densities The wooded ridges and valleys of Lokrís have only a few villages. The forested Óthris mountains, farther north, have probably less than 10 people to the sq. mile; villages are small and lie in isolated clearings, and the only occupations are the tending of sheep and goats, the making of cloaks, and charcoal burning. Elsewhere, however, the drained soils of the basins and the alluvial coastal plains form populous areas. Chief among these is the well-watered valley of the Sperkhiós, intensively cultivated and supporting 225 people to the sq. mile. Lamía (14,205), a road and rail centre of considerable importance (Plate 3), stands on the northern edge of the valley, and is connected eastwards with Stilís on the Maliaic Gulf. It trades in tobacco, cereals and olives, and has soap and carpet industries. In the south, beyond Brállos and Amfíklia, the vale of Kifissós is under cereals, fruit and cotton, and has 165 people per sq. mile. It leads to the now drained basin of Kopaís, where the density of rural population is only 150 per sq. mile, in spite of the fertility of its recently reclaimed soils. The large and partly industrialized town of Levádhia lies in the west of the basin, and is a centre for the cotton industry. The coastal plains, where continuous, have densities between 150 and 200 per sq. mile. The largest is that of Almirós, on the western shores of the Gulf of Pagasaí, the coast itself is sparsely peopled, but the plain farther inland has many villages amidst the fruit orchards and tobacco fields The town of Almirós is the largest centre, with over 6,000 inhabitants. The small maritime plains on the Gulf of Évvoia are used for fruit-growing, and have no important towns except perhaps for Atalándi and its port of Livanátais.

The island of Évvoia has only three regions of heavy population and these are all small. Incomparably the largest town is that of

Khalkís, with a population of 20,760 in 1938 (see p. 272) and with a tiny, but densely peopled, plain in its immediate hinterland. Almost due east, on the other side of the island, is the rich agricultural district of Kími, with 425 people to the sq. mile. Finally, on the north coast of the island, the maritime plain of Oreoí and Istiaía is well peopled and intensively cultivated.

D. *Eastern Greece*

Western Makedhonía and Thessalía fall naturally into four parallel belts, two of which are mainly lowland and the other two mainly highland The most westerly borders the dividing mountains of Greece, and is formed by the valley of the upper Aliákmon in the north and the upper Thessalian plain in the south. It is the easiest land route into Greece, and, probably as a result of its troubled history, the Aliákmon valley has remained backward, and, for its altitude, thinly peopled The only large settlements are Kastoría, Neápolis, Siátista, Grevená and Karperón—all commercial centres of strategic importance Grevená is a Vlach settlement and Kastoría (10,308) is noted for its fur trade (Plate 5). The average density of population in the valley is little more than 50 to the sq. mile. Farther south, the density over the upper plain of Thessalía, one of the largest plains in Greece, amounts to 160 people per sq. mile. The large estates were broken up by expropriation laws as long ago as 1922, but the people continue to live in the villages that grew up around the *Tchifliki*. In winter, the population is greatly increased by herdsmen, while large numbers of Vlachs inhabit the towns of western Thessalía, such as Tríkkala and Kalabáka. These two towns, with Kardhítsa on the southern edge of the plain, are connected by metre-gauge railway to the port of Vólos. Tríkkala, with 18,862 inhabitants, has an important trade in cereals, rice, tobacco, sesame and other crops The rich deep loams will obviously support many more people than at present, but the full benefits of recent irrigation works and flood control have yet to be experienced.

To the east of the upper Aliákmon, mountains of granite and gneiss rise abruptly to high plateaux. They have a density of well over 50 people to the sq. mile, for each deep-cut valley supports at least one village, and where the valleys provide routes across the mountains, as at Klisoúra, small towns have grown up. In the south, the Kamvoúnia and Oxiá mountains support few people and the only large village is Dheskáti, long famous as a centre of brigandage.

The second lowland belt consists of a series of basins, each of

which has been strongly affected by the exchange of populations. Until 1923 the basins were peopled almost exclusively by Moslems; to-day, apart from some Macedo-Slavs and Vlachs they are entirely Greek. In the north, the fertile and well-cultivated plain of Flórina has 200 people to the sq. mile, for the most part refugees from Anatolia Flórina, with 11,770 inhabitants, is the regional centre and an important road junction. The basin of Eordhaía to the south has a population of 44,000, of whom some 25,000 came from Anatolia. There are about forty villages, lying mainly on the margins of the plain, and wheat, maize and tobacco are grown. The villages to the south of the remaining lakes suffer severely from malaria, but elsewhere, surface water is rare and conditions are much healthier. Ptolemaís is the biggest town, with 6,600 inhabitants. To the south, the plain is separated from the Aliákmon valley by a high threshold on which stands Kozáni, a route centre with some 13,640 people. It is connected by a good road with Sérvia, Elassón and Lárisa to the south. Finally, the plain of Lárisa, or the lower plain of Thessalía, has a total population of almost 70,000, giving an average density of 120 per sq. mile. Here, as on the upper plain, the land is under cereals, and the people live in villages around the one-time *Tchiflik*. Lárisa on the right bank of the Piniós is the most important route centre in eastern Greece (see p. 386).

The most easterly of the four belts is the mountain barrier that extends from the Nidže mountains on the Jugoslav frontier to the peninsula of Magnisía. It shows great variety in the distribution of population, from the uninhabited summits of Ólimbos and Óssa to the intensively cultivated riviera coast south of Mount Pílion with 425 people per sq. mile. In the north, the barren limestone mountains of Vérmion have few villages and support only a few summer flocks. But at their junction with the plain of Kambánia are the three large towns of Édhessa, Náousa and Véroia. Édhessa, with 14,780 inhabitants, was once the capital of Macedonia; Náousa (11,820) and Véroia (17,960) are set amidst vast orchards of fruit trees such as cherries, mulberries and plums All three towns stand on terraces of calcsinter and have begun to use hydro-electric power for their growing textile industries.

Southwards, the zone of sparse population continues through the Piéria mountains, Ólimbos and Óssa to Pílion, interrupted only by the strip of country around Ayiá, where a southerly aspect favours intensive agriculture. What few villages there are in the region cling to abrupt slopes, and both the plateaux and the Aegean coast are

almost without settlement. In the peninsula of Magnisía, however, in spite of the wild nature of the country, the mountain slopes are among the most densely peopled parts of Greece. The villages are more numerous on the slopes leading to the Gulf of Pagasaí than those facing the Aegean, and are often hidden in orchards or oak and chestnut woods. The most densely peopled belt is on the north-eastern shores of the gulf, to the east of Vólos (see p. 258).

E. *North-eastern Greece*

Central and eastern Makedhonía with Dhitikí Thráki form a remarkable physical region, where broad and once swampy plains are separated from one another by high crystalline plateaux. At the beginning of this century it was one of the most poverty-stricken parts of Europe, with an average population density of less than 75 people per sq. mile. But few regions have been so completely transformed in so short a time, and to-day the average density approaches 130 per sq. mile. This amazing change has resulted from the exchanges of population, both with Turkey and Bulgaria, from the draining of large areas of malarial lowlands, from the doubling of the cultivated area and from the concentration in favoured localities upon valuable crops, such as tobacco.

In spite of the general increase in population the region still contains one of the largest areas of sparse population anywhere in Greece. This is the belt of the high Rodhópi mountains that extends along the northern frontier for some 200 miles and supports a population of between 5 and 75 people to the sq. mile. Few roads and no railways cross this mountainous belt, and what small villages there are lie in almost inaccessible districts. In the western part of the mountains the people were mostly Moslems and were removed after 1923, but their replacement by Greek refugees was not successful, and many of the villages have fallen into ruins. Farther east the Moslem population (Pomaks) was allowed to remain and there are many clearings in the woodlands where rye, maize, fruit and tobacco are cultivated. Ekhínos is the largest centre, a market town with about 2,000 inhabitants, and there is an average density in this locality of 62 people per sq. mile. Eastwards, the mountains become narrower, water is scarce, and the population density falls to between 25 and 40 people to the sq. mile. The frontier with Turkey is not distinguished by high mountains, but a broad belt of hill country rising to over 3,000 ft. extends southwards to the coast. It is largely forested, with a few villages in its lower, radial valleys and groups

of huts in higher summer pastures in forest clearings. The total population over the 640 sq. miles is only some 5,000 people.

The only remaining belt of sparse population extends southward from the frontier of Jugoslavia to the coasts of the Khalkidhikí peninsula The average density is less than 65 people per sq. mile, and the thin soils of the high plateaux yield few crops. The Khalkidhikí peninsula has always been an isolated region, there are practically no coastal plains and the few villages close to the sea are often high above it. In the interior, the high crystalline mountains, covered with juniper and oak garrigue (scrub), have an average density of only 28 to 60 people per sq. mile. The regional capital is Políyiros, a small town on the motor road leading north from the Gulf of Kassándra. Áyion Óros, in the south-east of the peninsula, has twenty monasteries forming a self-governing community of monks; it is unique in that it is the only administrative province in Greece where the population has declined since 1920

Five great plains stand out as areas of relatively dense population in north-eastern Greece. The most westerly is the plain of Kambanía, the scene of vast reclamation works since 1928. It has a density of 280 people per sq. mile. It is estimated that 8,958 families of refugees were settled here, and together with an original population of 5,395 peasant families they are changing the rural economy from pastoralism to the cultivation of cereals, cotton, mulberries, tobacco and vines. Although malaria has been greatly reduced, the people still live in villages on terraces and lacustrine deposits at the edge of the plain. Thessaloníki is the dominating town of the area (see p. 241). Due north, towards Lake Doïráni, is the rapidly growing market town of Kilkís, with 6,864 inhabitants in 1928 and 9,130 in 1938, while Yiannitsá, just to the north of the drained lake of that name, is even larger (13,470 in 1938).

The second great plain is that of the river Strimón with 215 people to the sq. mile. Like the plain of Kambánia to the west, it suffered greatly from malaria up to 1930, and of the total area of some 300,000 acres, 184,000 were marshy. But here, too, reclamation has increased the area of cultivable land. Cotton, rice, maize, wheat and tobacco support a growing population. A line of towns marks the northern edge of the plain and amongst them Sérrai is one of the largest agricultural markets of Greece (see p 387).

The plain of Dráma is entirely enclosed by barren crystalline mountains and supports 350 people to the sq. mile. The high density is the result of intensive cultivation—rice, vines, cotton, and

above all, tobacco. The town of Dráma in the north of the plain dwarfs all other settlements (see p. 382), and like Kaválla on the coast it owes much of its growth to the tobacco industry. Since 1930 refugee suburbs have more than doubled the population of the old Genoese port of Kaválla (see p. 266).

The broad plains of Xánthi and Komotiní are in Dhitikí Thráki, which was not subjected to an exchange of population Nor were the large estates broken up to the same extent as in the rest of Greece. The population densities of the two plains, Xánthi, with 235 people to the sq. mile and Komotiní with only 116, are therefore lower than the fertility of the land would indicate. As yet there are few settlements on the coast itself, for the broad stretches of coastal lowland are flat, badly drained and marshy. Inland, however, the plains are drier and well populated, and are devoted to tobacco cultivation. Xánthi (see p. 388) and Komotiní (see p. 385) are two of the largest towns of north-eastern Greece, while much of the trade of Alexandroúpolis (see p. 269) is based on the agricultural importance of the region.

The fifth and most easterly of the plains is the broad and ill-drained lowland of the river Évros. The Greek part, on the right bank of the river, has a density of only 125 people to the sq. mile, a figure which will increase greatly with the regularization of the Évros. The only towns of note are on the Alexandroúpolis-Edirne railway, which narrowly avoids the river marshes to the east and the spurs of the Rodhópi mountains to the west. From south to north they are Férrai, Lainá, Soufliòn (8,620), Dhidhimótikhon (9,440) and Orestiás (10,530).

F. *The Pelopónnisos*

In 1838 the Pelopónnisos was the most densely peopled part of the kingdom, after the Kikládhes, by 1938 it had been surpassed by the Ionian and Aegean islands, and by Central Greece The distribution of population by administrative provinces is shown in the table on p. 17.

Fig. 4 shows the wide regional variations in population densities, from the uninhabited summits of the northern ranges to the heavily populated plain of Messinía with over 580 people to the sq. mile The distribution pattern is more complex than anywhere else in Greece and reflects the diversity of physical regions. Lowlands are few and isolated, but there are also many upland plains of varying sizes; the rest of the peninsula is mainly a region of wild and rugged

Distribution of Population by Nomoí in the Pelopónnisos

Nomoí	Area in sq miles	Population, 1928 census		Population estimates, 31 Dec. 1938	
		Total	Pop. per sq. mile	Total	Pop per sq mile
Argolís-Korinthía	1,787	165,766	93	190,184	106
Arkadhía	1,671	166,141	99	187,327	112
Akhaía	1,142	190,422	166	213,291	187
Ilía	828	130,201	157	148,554	179
Lakonía	1,454	129,927	90	148,499	102
Messinía	1,474	262,316	178	297,191	202
Pelopónnisos	8,356	1,044,773	125	1,185,046	141

Source. *Annuaire statistique de la Grèce*, 1939, p. 30 (Athènes, 1940).

highlands built of limestone. Throughout the Pelopónnisos, villages avoid the valleys and are placed high up on the hill-sides, or more rarely, on mountain summits. Each village often forms two or three small compact groups of houses, located, for example, on each side of a ravine or at different levels above the lowland.

The broadest area of dense population is in the north-west, in the provinces of Ilía and Akhaïa. The growth of population on these maritime plains has been phenomenal, increasing by over 300% from 1838 to 1938. This has been due almost entirely to the development of the currant trade after 1850. Pátrai is by far the largest port (see p. 251), and there are numerous market towns with populations of over 5,000. The largest are Aíyion, with 12,130 inhabitants, on the narrow coastal plain of Akhaía; Amaliás in Ilía with 14,500, and Pírgos near the mouth of the Alfiós with almost 20,000 inhabitants. Pírgos is the administrative and commercial capital of Ilía (Plate 8).

The plain of Messinía at the head of the Gulf of Messinía is not as extensive as the north-western plains, but it is the most densely populated agricultural region in Greece. Its irrigated soils produce cereals, citrus fruits, mulberries, and even bananas, while on the higher slopes vines are abundant. The plain has an average density of almost 600 people to the sq. mile. Kalámai, with 32,870 inhabitants, is the chief port (see p. 262) and the second city of the Pelopónnisos Messíni, 6 miles away, has a population of 7,410 inhabitants. It is an administrative centre and a railway terminus. The

coastal plains of Messinía also support a large population (Plate 16), but the ports of Koróni, Methóni and Pílos are all small.

The plain of Lakonía, drained by the Evrótas, is less densely peopled. Villages avoid the marshy head of the gulf and the port of Yíthion has only 9,520 inhabitants (see p. 305). Farther inland, towards the plain of Spárti, orange, fig and vine cultivation supports 235 people to the sq. mile. Spárti is a somnolent town of only 8,720 inhabitants (Plate 9). The valley of the Evrótas leads northwards to the headwaters of the Alfiós and the basin of Megalópolis, a town very much smaller than its name suggests.

The plain of Argolís in the north-eastern Pelopónnisos has a population density of 400 to the sq. mile. Tiryns, Argos and Mycenae were three of the greatest cities in Mycenaean Greece, but their power was based more on their strategic position than upon the fertility of their plain Árgos, with 12,430 inhabitants, is to-day a large market town, exporting its produce through Návplion (see p. 303) The plain is linked by road and rail with Kórinthos to the north (see p. 301).

The density of population over the remainder of the Pelopónnisos is small, ranging up to 125 people per sq. mile. There are, however, two exceptions. The enclosed basin of Trípolis in Arkadhía has always been one of the most highly cultivated plains of Greece, and, during times of peace, the centre of a flourishing urban life. The population density averages 160 per sq. mile over the plain, but most of the villages are on the edge of the basin, and the density rises along the marginal belt to over 350 (Plate 10). Trípolis with 15,480 inhabitants is the greatest route centre in the Pelopónnisos. The second exception is the peninsula of Máni, where the soil is too poor even for kermes scrub, and where the poverty of the land is unequalled throughout Greece. But while the region offered famine to any who lived there it also offered independence, and even to-day the density of population is 160 per sq. mile. As a legacy of its turbulent history, the inhabitants live in villages on almost inaccessible cliffs, hedged in by thickets of cactus.

The Ionian Islands

The population of the Ionian islands in 1938 was 231,510, giving an average density of 294 people per sq. mile. They form, therefore, the most densely populated administrative region in Greece. The table on p. 19 shows the growth of population from 1928 to 1938 in the three *nomoi*.

Distribution of Population in the Ionian Islands

Nomoi	Area in sq miles	Population, 1928 census		Population estimates, 31 Dec 1938	
		Total	Pop per sq mile	Total	Pop per sq. mile
Kérkira	246	106,251	430	114,620	466
Kefallinía	348	66,414	192	72,140	208
Zákinthos	157	40,492	234	44,750	285
Ionian islands	751	213,157	274	231,510	294

Source. *Annuaire statistique de la Grèce*, 1939, p 30 (Athènes, 1940)

The island of Kérkira depends for its high population density upon an intensive agriculture and a low standard of living among the peasants. The white villages are hidden by olive groves, especially on the central part of the island, where the density rises to 590 per sq. mile. In the north and south, the relief is more broken, the soils less fertile, and the density falls to 160 and 180 respectively. The town of Kérkira, with 34,740 inhabitants in 1937, dominates the trade of the island (see p 281). Only 17% of the surface of Kefallinía is under cultivation, and it is the least populated of the large islands of the Ionian Sea. The centre and east are sparsely inhabited, but elsewhere the production of currants supports a dense population. Argostólion, the capital with 9,080 people, and Lixoúrion with 5,400 are the principal ports of the island. They stand on opposite shores of the Gulf of Argostólion and are engaged primarily in the export of currants. The island of Zákinthos is barren and high in the west, with few inhabitants Towards the east, the slopes are more gentle and the majority of the people live in small towns on the low foothills. The port of Zákinthos, with 12,760 people, has an active trade with Pátrai (Plate 11).

The Thracian Islands

The four islands of Thásos, Samothráki, Límnos and Áyios Evstrátios lie in the northern Aegean. Thásos has a density of 76 per sq. mile and closely resembles the crystalline plateaux of north-eastern Greece. The mountainous island of Samothráki has few villages and no towns; in 1928 its population was little more than 50 per sq. mile. Límnos, the largest of the four islands, has broader and better cultivated plains. Most of its villages are in the interior

of the island, where they sought security from the Saracen raids of the ninth century. Áyios Evstrátios has an area of only 17 sq. miles and a population of less than 1,000.

The Northern Sporádhes

The people of the Northern Sporádhes are mainly engaged in seafaring and cattle-raising. Skíathos with a density of 183 and Skópelos with 166 people to the sq. mile, are the most fertile and most heavily populated. Skíros, the largest island of the group, is famous for its marble, but the poverty of the soil is such that the density falls to 40 per sq. mile.

The Kikládhes (Cyclades)

Throughout the history of Greece the Kikládhes have been well peopled. Turkish rule was mild, and at the census of 1838 the islands had a density of 100 people per sq. mile. By contrast, Attikí-Voiotía had only 25 at this time. Apart from Ermoúpolis, on the east coast of Síros (see p. 287), there are no towns engaged in foreign commerce. The other ports have only a local traffic and are insignificant in size. Síros, combining maritime activities with agriculture, has a density of 834; Thíra, clothed with vineyards, one of 342 (Plate 12). Most of the other islands have less than 100 people per sq. mile (Plate 13), and the smallest are uninhabited.

The Islands of the Eastern Aegean

The populations of the *nomoí* of Lésvos, Sámos and Khíos for 1928 and 1938 are given below:

Nomoí	Area in sq miles	Population, 1928 census		Population estimates, 31 Dec 1938	
		Total	Pop per sq mile	Total	Pop per sq mile
Lésvos	836	161,557	194	177,214	212
Sámos	322	70,497	220	77,858	243
Khíos	348	75,680	220	82,914	238
Aegean islands	1,506	307,734	205	337,986	225

Source: *Annuaire statistique de la Grèce*, 1939, p 30 (Athènes, 1940).

Each of the islands specializes in some form of intensive agriculture, which is combined with maritime activities in the local economy.

Thus Lésvos, the least densely peopled of the islands because of its high proportion of volcanic and ancient metamorphic rocks, specializes in olive oil and tobacco. The port of Mitilíni, on the east coast, has a population of 34,300, and is described on p. 293. Sámos is sparsely peopled in the mountainous limestone regions, but on the Tertiary sediments of the east there is a concentration upon olives, vines and tobacco. Vathí, on the north-east coast, is the principal port, with 6,090 inhabitants (see p. 299). Khíos has a barren and mountainous backbone, but the low spurs and valleys produce citrus fruits, olives and gum mastic, and support a dense population. The town of Khíos has 27,880 inhabitants (see p. 297).

Kríti (Crete)

The population of Kríti at the census of 1940 was 438,000. The following table gives the distribution by administrative provinces for the census of 1928 and at the end of 1938:

Nomoí	Area in sq miles	Population, 1928 census		Population estimates, 31 Dec 1938	
		Total	Pop per sq mile	Total	Pop per sq mile
Iráklion	989	144,921	146	162,978	165
Lasíthi	737	61,813	84	75,914	103
Rethímni	582	67,674	116	76,141	131
Khaniá	927	112,019	121	126,654	137
Kríti	3,235	386,427	120	441,687	136

Source *Annuaire statistique de la Grèce*, 1939, p 30 (Athènes, 1940)

The population lives almost entirely in villages, which have rarely more than 200–300 inhabitants. In contrast with the rest of Greece the Cretan peasant lives near his fields, and very many of the villages are placed on the middle slopes of the mountains in the zone of the olive groves. They are rarely more than 2,000 ft. above sea level, but hamlets, occupied during the summer months for work in the vineyards, may extend up to 3,000 ft. Above this height there are only primitive huts for shepherds.

There is great diversity of relief, geological structure, soils and water supply throughout the island. These factors have largely determined the location of villages and the density of population. Four mountainous areas, mainly composed of limestone, stand out

as regions of less than 40 people per sq. mile. They are the Lévka Óri in the west, the Mount Ídhi massif, Mount Dhíkti, and finally, the mountains of Sitía. They are barren and serrated uplands, cut by impassable ravines, but occasionally enclosing some upland basin where a few villagers keep flocks of sheep and goats or cultivate the soil.

The limestones rest upon lower and older rocks where springs and surface water are much more numerous. The terraced slopes of these impermeable rocks support a comparatively dense population. The plains of Kríti, composed mainly of Tertiary rocks, cover only 300 sq. miles, and two-thirds of this area is in the plain of Mesará in southern Iráklion. Other tiny plains lie on the north coast near the harbours of Iráklion, Réthimnon and Khaniá. They have densities of some 200 people per sq. mile, and under irrigation, wheat, maize, tobacco, cotton, olives and citrus fruits can be grown. But the richness of the plains is offset by the dangers of malaria, and most of the villages are placed on the margins of the lowland. The growing of industrial crops, especially after the arrival of 4,773 refugee families from Asia Minor in 1923–6, has greatly increased the commercial importance of the towns of Kríti. These are all ports on the north coast, chief of which are Khaniá (see p. 290), Réthimnon and Iráklion (see p. 284).

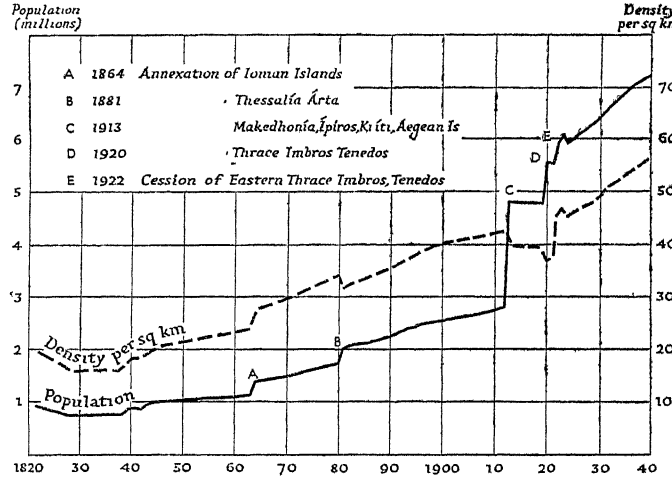

Fig 5 The growth of population in Greece, 1821–1930

Based on data in *Annuaire statistique de la Grèce*, 1931, pp. 22–3 (Athènes, 1932). The population figures are given at yearly intervals after 1838; prior to that date they are only available for 1821 and 1828.

The Growth of Population

In 1821, when Greece began the War of Independence, the population of the country numbered 940,000. In 1940 it was 7,336,000. This enormous increase (Fig. 5) has resulted from territorial expansion, from the coming of refugees from Bulgaria and Asia Minor, and from the balance of births and deaths. Against these factors must be set the loss due to emigration.

Territorial Expansion

The territorial growth of Greece from 1832 to 1922 is shown in Fig. 6, and is by far the greatest factor in the increase of population. The following table summarizes these changes:

Area annexed	Date	Area in sq miles	Population
Ionian islands	1864	1,813	236,000
Thessalía and Árta	1881*	5,173	294,000
Makedhonía, Ípiros, Kríti, Aegean islands	1913	24,634	2,085,000
Thrace, Ímbros, Tenedos	1920	11,213	717,000
Total		42,833	3,332,000

Sources (i) *Statistique internationale du mouvement de la population*, vol I, p. 63 (Paris, 1907), (ii) *Annuaire statistique de la Grèce*, 1939, pp 423–4, 516 (Athènes, 1940).

* The rectification of the Turco-Greek frontier in 1897 did not affect the growth of population, because the inhabitants of the small strip of land retroceded to Turkey took refuge in Greece

Thus, of the total increase of 4,660,000, between 1821 and 1921, about 3,332,000 were due to annexations of territory and only about 1,328,000 to other causes. By the Treaty of Lausanne in 1923, however, Greece yielded the districts of Eastern Thrace, Ímbros and Tenedos, with a population of 515,000 inhabitants (according to the census of 1920) and an area of 8,090 sq. miles. The net gain, therefore, has been an increase of over 2,800,000 people.

Refugee Movements

During the years 1922–6 Greece had a unique demographic experience in an exchange of populations with both Turkey and Bulgaria. The Graeco-Turkish exchange was compulsory in character and involved over one million Greeks from Turkey and nearly 400,000 Moslems from Greece. The Graeco-Bulgarian exchange was on a voluntary basis and involved 92,000 people from Greece and

46,000 from Bulgaria. Both exchanges were an attempt to solve the complicated ethnic problem of Macedonia and Thrace and are fully discussed in Chapter XIII, vol. I, of this Handbook. A summary of population movements to and from Macedonia and Thrace, 1912–24, is given in vol. I, p. 351, and it demonstrates the complex

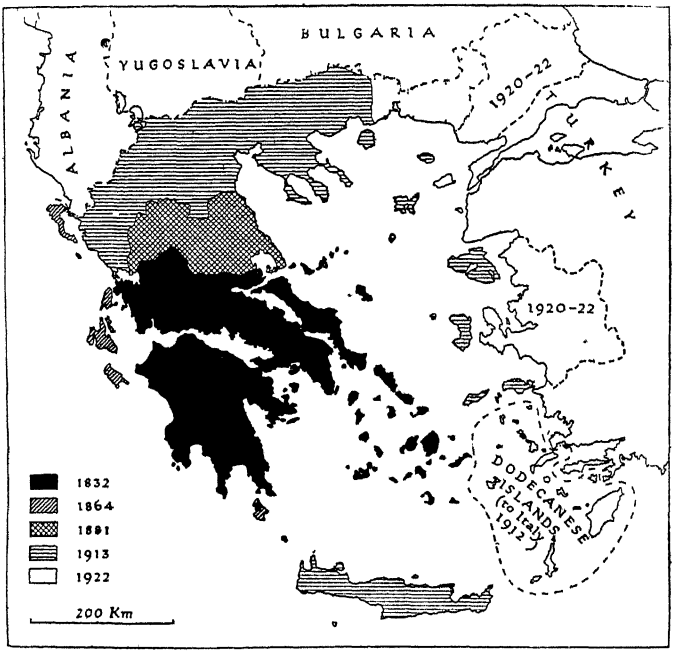

Fig. 6. The growth of Greece

Based on (1) R. Muir and G. Philip, *Historical Atlas*, p 86, 6th ed (London, 1924); (2) I. Bowman, *The New World*, pp. 403 and 515, 4th ed (New York, 1928) The frontier of 1881 was modified in 1897 when a number of small points were retroceded to Turkey The Treaty of Sèvres (August 1920) gave Greece the greater part of Eastern Thrace and also Smyrna, the latter subject to a plebiscite in five years' time. These provisions came to nothing after the disaster of September 1922, and were cancelled by the Treaty of Lausanne (July 1923)

nature of these migrations. According to the census of 1928, the refugee population numbered 1,221,849, but it is not possible to deduce the original number because no data were available for births, deaths and emigration among the refugees on and after their arrival. On the other hand, about 482,000 Moslems and Bulgarians left Greece. On balance, therefore, Greece gained at least 740,000 people between 1922 and 1926.

Emigration

The increase in population by the acquisition of territory and the arrival of refugees has been partly offset by the large number of Greeks who have emigrated to the United States (Fig. 7). In the 100 years from 1821 to 1921, some 420,000 emigrants had gone overseas. Before 1890 very small numbers had found their way abroad; in 1896 there were 2,000 emigrants, in 1900 there were 3,771, and a sudden impetus brought the movement to its first peak

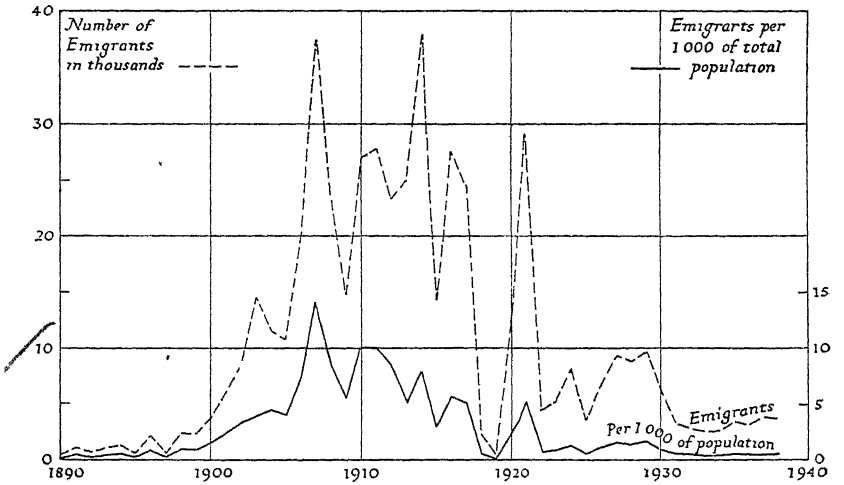

Fig 7 Emigration from Greece, 1890–1938
Based on data in *Annuaire statistique de la Grèce*, 1939, p 494 (Athènes, 1940)

in 1907 when 37,391 left the country. These represented over 14 per 1,000 of the population, which then stood at 2,631,952 (Fig. 7). Until 1917 the annual emigration never fell below 14,000, and in 1914 reached its maximum figure, 37,957. The two years of peace, 1920 and 1921, were marked by the departure of nearly 42,000 people, mostly men who had been recalled from abroad to join the Greek forces. From then onwards overseas emigration has been negligible and has not seriously affected the growth of population. It must be remembered that a considerable number of emigrants subsequently returned to Greece, usually much better off than before, and that remittances from abroad have been a valuable source of income to Greeks at home (Fig. 30).

The Balance of Births and Deaths

The compilation of vital statistics was started in 1860, but it is not possible to obtain continuous records of Greek births and deaths since that year. Thus, for the years 1862, 1863, 1886, 1887 and 1888, no tables are available and only preliminary figures are available for 1889 and 1890. From 1891 to 1920 no records were kept at all. In 1920, a new law was passed, making civil registration compulsory, but this law was not put into force for births before 1 January 1925. The omissions were most conspicuous in the urban districts and, in general, for illegitimate children; they were particularly frequent for girls, since the Greek laws on military service make registration for boys more important. Moreover, a considerable number of municipalities failed to send any reports to the Central Statistical Office. From 1925 onwards, the number of municipalities not reporting decreased, and by 1927 only 1·7% of the population was not covered by vital statistics. Since that year birth and death records have covered the whole country and are fairly complete. The following table shows the natural increase of population between 1929–39, which has averaged 1·3%. It is not easy to compare this average with those for previous years, but it is probably greater than at any other time since 1821, and certainly greater than the period 1922–8 when it has been estimated at 0 8%

Natural Increase and Migration, 1929–39

Year (Jan)	Population	Births	Deaths	Excess of births over deaths	Excess of arrivals over departures
1929	6,246,583	181,870	115,561	66,309	—9,619
1930	6,303,273	199,565	103,811	95,754	—1,196
1931	6,397,831	199,243	114,369	84,874	736
1932	6,483,441	185,523	117,593	67,930	—2,917
1933	6,548,454	189,583	111,447	78,136	3,737
1934	6,630,327	208,929	100,651	108,278	7,391
1935	6,745,996	192,511	101,416	91,095	2,350
1936	6,839,441	193,343	105,005	88,338	5,635
1937	6,933,414	183,878	105,674	78,204	1,375
1938	7,012,993	184,509	93,766	90,743	5,078
1939*	7,108,814	168,200	92,800	75,400	16,786

Sources· Based on (1) *Bulletin mensuel de statistique de la Grèce, Janvier* 1933, p 6 (Athènes, monthly), *ibid Mars* 1940, p 142, (11) *Statistical Year Book of the League of Nations*, 1940–1, pp 17, 33, 35 (Geneva, 1941).

* The figures for 1939 are preliminary.

Age Groups

The age composition of the population is a product of its past, and has a vital bearing upon its future. The effects, for example, of wars upon mortality and fertility are to be noticed for many decades. That Greece suffered less in the war of 1914–18 than some other countries of south-eastern Europe appears from the table on p. 28,

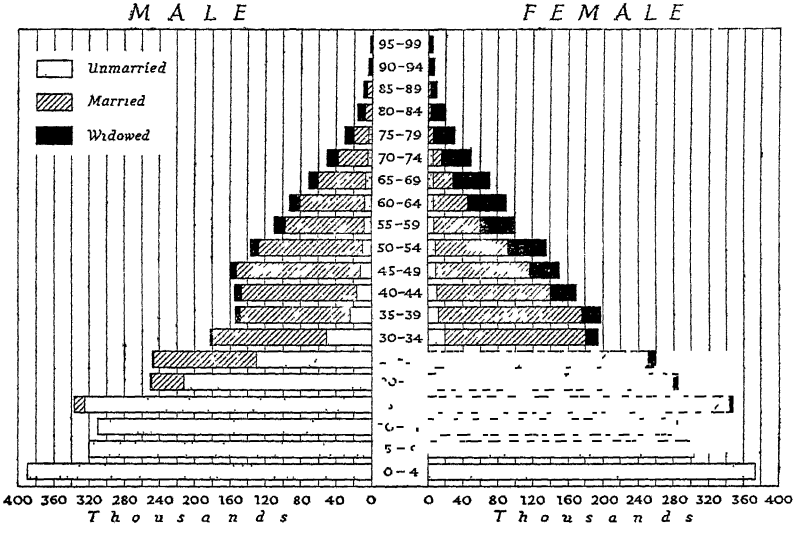

Fig. 8. The composition of the population of Greece by age, sex and civil status in 1928

Based on *Annuaire statistique de la Grèce*, 1931, p. 32 (Athènes, 1932).

which shows the age composition of the population of Greece and neighbouring countries. On the other hand, the effects of the ten years of war from 1912–22 can be seen in Fig. 8, where the number of men between the ages of 20 and 45 is very much smaller than the number of women for corresponding age groups. The effect of war is also to be seen in the high proportion of women over 30 years of age who were widows.

The proportion of children was smaller in Greece and the proportion of old people was larger than in Bulgaria, Roumania and Jugoslavia. The position may be summarized as shown by the lower table on p. 28.

Population by Quinquennial Age Groups

Age (years)	Greece (May 1928)		Bulgaria (Dec 1926)	Roumania (Dec 1930)	Jugoslavia (Apr 1931)	England and Wales (Apr 1931)
	Number	%	%	%	%	%
0–4	764,363	12 3	14 3	14·6	14 1	7·5
5–9	625,601	10·1	10 4	12 1	12 6	8 3
10–14	599,737	9 7	10 3	8 0	7 9	8 0
15–19	693,619	11 2	11 0	11 7	9·2	8 6
20–24	547,875	8 8	9 7	9 0	9 8	8 7
25–29	518,142	8 4	8 1	8 6	8 4	8·4
30–34	382,737	6 2	6 3	6 0	7·2	7 6
35–39	375,185	6 0	5 6	6·5	5·5	7 0
40–44	326,635	5 3	5 4	5 0	5 2	6 7
45–49	312,891	5 0	4 2	5 1	4·6	6 4
50–54	275,408	4 4	3 3	3 2	4 1	6 0
55–59	208,917	3 4	3·3	3 2	3 1	5 2
60–64	191,064	3 1	2 7	2 3	2 9	4 1
65+	362,471	5 8	5 4	4 3	5 3	7 4
Unknown	20,039	0 3	0·0	0·4	0 0	0 0
Total	6,204,684	100 0	100 0	100·0	100 0	100 0

Source· *Statistical Year Book of the League of Nations*, 1940–1, pp 27, 29, 31 (Geneva, 1941), (ii) *Annuaire statistique de la Grèce*, 1939, pp. 52–3 (Athènes, 1940), (iii) *Annuaire statistique de la Bulgarie*, 1939, p 43 (Sofia, 1940).

Population by Large Age Groups

Age (years)	Sex	Greece	Bulgaria	Roumania	Jugoslavia	England and Wales
0–14	M.	33 4	35·6	35 8	35 7	25 1
	F	31 0	34 2	34 0	33 6	22·6
15–49	M.	49 8	49 6	51 1	49 4	53 1
	F	52 2	51 1	52 9	50 4	53 8
50+	M	16 8	14 8	13 1	14 9	22 8
	F	16 8	14 7	13 1	16 0	23 6

The Death-rate

From 1821 to 1920 the death-rate, that is, the number of deaths per 1,000 inhabitants, was on an average about 8 or 9 lower than the birth-rate, but it is impossible to tell what it actually was. The figures for 1921–7 are likewise uncertain. In 1928 the death-rate was 17 0 as compared with 17 7 in Bulgaria, 20·2 in Roumania, and 20·4 in Jugoslavia.

The crude death-rate shows the proportion by which a population decreases through deaths, but it is not an adequate measure of

mortality, since it is calculated without regard to the age composition of the population. The best method of eliminating the disturbing influence of the age composition is to compute a life table. Such a table shows how many people out of 100,000 live-born would survive a given age if they were constantly subjected to the mortality of the period under consideration, and it shows, furthermore, the mean expectation of life at various ages. According to the 1928 life-table for Greece (the only one that has ever been computed) the mean

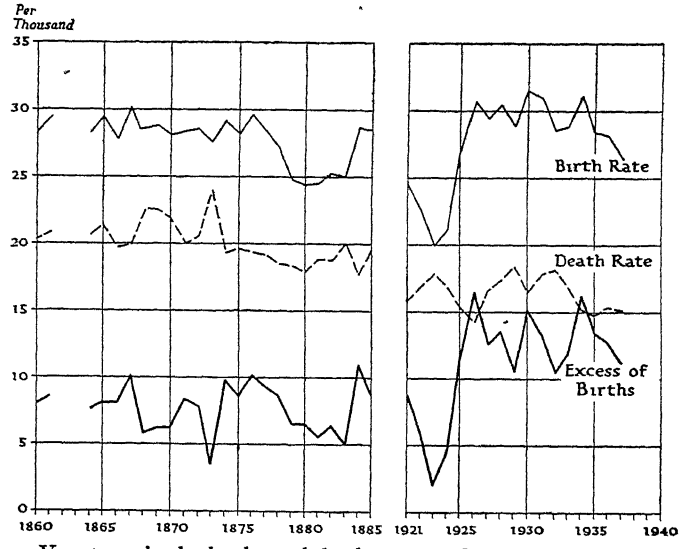

Fig 9. Variations in the birth- and death-rates in Greece, 1860–85, 1921–37
Based on data in *Annuaire statistique de la Grèce*, 1938, p. 431 (Athènes, 1939). From 1885 to 1921 there are no records of vital statistics, and those before 1885 are incomplete and have been estimated

expectation of life at birth was 49 09 years for males and 50·89 years for females The corresponding figures for Bulgaria, 1925–8, were 45·92 and 46 64 respectively (see table on p. 30).*

The computation of a life-table presupposes a knowledge of the age composition of the population and of deaths by age. But the age composition of the population has not been ascertained in Greece since 1928. It is therefore difficult to say anything definite about the trend of mortality in recent years. The crude death-rate has declined from 17·0 in 1928 to 13 0 in 1939 (Fig. 9). The death-rates show similar decreases in neighbouring countries (see table on p. 31)

* The mean expectation of life at birth in Greece, 1928, was similar to that in England and Wales, 1901–10, where it was 48 53 years for males and 52 38 years for females Since that time the mean expectation of life in England and Wales has risen markedly; in the period 1930–2 it was 58 7 for males and 62 9 for females.

Numbers surviving out of 100,000 *live-born and Mean Expectation of Life according to Life Tables*

Age (years)	Surviving out of 100,000 live-born				Mean Expectation of Life (years)			
	Greece 1928		Bulgaria 1925–28		Greece 1928		Bulgaria 1925–28	
	Males	Females	Males	Females	Males	Females	Males	Females
0	100,000	100,000	100,000	100,000	49 09	50 89	45 92	46 64
1	90,491	90,688	82,855	85,121	53 22	55 09	54 37	53 73
10	77,972	78,256	71,417	73,133	52 40	54 48	53 75	53 20
20	74,926	75,264	68,529	69,817	44 31	46 43	45 78	45 45
30	69,990	70,128	64,354	64,256	37 07	39 45	38 45	38 97
40	64,565	64,603	60,338	59,440	29 76	32 40	30 70	31 73
50	57,889	59,135	54,864	54,153	22·58	24 93	23 23	24·32
60	48,257	52,303	46,426	47,065	16 03	17 49	16 45	17 18
70	33,900	40,417	33,183	35,387	10 57	10 99	10 88	11 05

Source *Statistical Year Book of the League of Nations*, 1940–1, pp. 65–6, 69 (Geneva, 1941)

• *Death-rate per* 1,000 *Inhabitants*, 1921–39

Years	Greece	Bulgaria	Roumania	Jugoslavia	England and Wales
1921–27	(16 2)	20 2	22 9	20 1	12 2
1928	17 0	17 7	20 2	20 4	11 9
1929	18 4	18 1	21·4	21·1	13·6
1930	16·3	16 2	19 4	19·0	11 7
1931	17 8	16 9	20 9	19·8	12 5
1932	18 0	16 3	21 7	19 2	12 0
1933	16 9	15 6	18 7	17 0	12 3
1934	15·0	14 1	20 7	17 1	11 8
1935	14 9	14 6	21 1	16 9	11 7
1936	15 2	14 3	19 8	16·1	12 1
1937	15 2	13 6	19 3	15 9	12 4
1938	13 3	13 7	19 2	15 6	11 6
1939	13 0	13 4	18 6	15·0	12·1

Source (i) *Aperçu de la démographie des divers pays du monde*, 1931, p. xxv (Hague, 1932), *ibid*, 1929-36, p 162, (ii) *Statistical Year Book of the League of Nations*, 1940–1, pp 38–9 (Geneva, 1941), (iii) *Annuaire statistique, Royaume de Yougoslavie*, 1939, p 125 (Beograd, 1939)

Mortality, no doubt, has decreased in Greece, Bulgaria and Jugoslavia, but probably less than the crude death-rates suggest, because, other things being equal, the crude death-rate declines when the number of births decreases. Infant mortality itself, or the ratio of deaths under 1 year to 1,000 live-born, has not diminished since 1928 (see vol. I, pp. 268–9 of this Handbook).

Infant Mortality, 1928–38

Year	Greece	Bulgaria	Roumania	Jugoslavia	England and Wales
1928	94	149	184	150	65
1929	111	156	197	147	74
1930	99	138	176	153	60
1931	134	156	180	165	66
1932	129	150	185	167	65
1933	123	146	174	140	64
1934	112	131	182	150	59
1935	113	154	192	144	57
1936	114	144	175	137	59
1937	121	150	178	141	58
1938	99	144	183	144	52

Source *Statistical Year Book of the League of Nations*, 1935–6, p 45 (Geneva, 1936); *ibid.*, 1940–1, p 40

The Birth-rate, Fertility and Reproduction Rates

The Birth-rate. In those Balkan states for which adequate statistics are available, the birth-rate (the number of live-born per 1,000 inhabitants) was very high until the 1920's and decreased very rapidly thereafter In Greece nothing definite is known about the trend of the birth-rate prior to 1928. In that year the rate was somewhat lower than in Bulgaria, Roumania and Jugoslavia, and it has remained somewhat lower than in Roumania and Jugoslavia:

Birth-rate per 1,000 *Inhabitants*, 1921–39

Years	Greece	Bulgaria	Roumania	Jugoslavia	England and Wales
1921–24	(22 0)	39 6	38 4	35·3	20 3
1925–27	(29 0)	35 8	35·8	34 6	17 6
1928	30 5	33 1	35 9	32 7	16 7
1929	29 0	30 6	34 1	33 3	16 3
1930	31 4	31·4	35·0	35 5	16 3
1931	30 9	29 4	33·4	33 6	15 8
1932	28 5	31 5	35 9	32 8	15 3
1933	28·8	29 2	32·1	31·4	14 4
1934	31·2	30 1	32 4	31 5	14 8
1935	28 3	26 4	30·7	29 8	14·7
1936	28 1	25·9	31 5	28 9	14 8
1937	26 4	24 3	30 8	27 9	14·9
1938	26 1	22 8	29 6	26·7	15·1
1939	23 5	21 4	28 3	25 3	15 5

Source. (i) *Aperçu de la démographie des divers pays du monde*, 1931, p xxiv (Hague, 1932), *ibid*, 1929–36, p 161; (ii) *Statistical Year Book of the League of Nations*, 1940–1, p 37 (Geneva, 1941), (iii) *Annuaire statistique, Royaume de Yougoslavie*, 1939, p. 125 (Beograd, 1939)

Fertility and Gross Reproduction Rate. The crude birth-rate provides only a very rough idea of the trend of population growth. Neither this rate nor the balance between it and the death-rate is a true measure of the capacity of a population for further increase. Thus, in spite of the fact that births still exceed deaths, a population may no longer be replacing itself. Even while it is increasing in numbers, it may be preparing for decline. This paradox arises from the fact that the capacity of a population for further increase depends upon its fertility and mortality in different age groups. Fertility, in turn, clearly depends upon the number of women between 15 and 50, the reproductive period. But since younger women have a higher fertility than older women, the composition of the population by age, especially by the age of its women, is important. If the numbers

of children born to every thousand women in every year up to the age of 50 are added, the result gives the number of children which would be born on an average to every thousand women before the end of the reproductive period, provided that no women died before reaching 50 years, and that the current fertility of women at different ages remained unchanged. This figure is known as the 'total fertility' of the population. But as this figure includes both boys and girls, it is not a measure of the extent to which the population is equipping itself for further reproduction. This is expressed by reducing the figures for 'total fertility' in the same proportion as the ratio between females born and total births; the result is called the 'gross reproduction rate', and it is usually expressed, not per thousand, but per unit.

In Greece, however, a knowledge of the age composition of the female population has not been ascertained since 1928, and a knowledge of the age of mothers at birth has been recorded only from 1931 onwards An approximate calculation of the Greek gross reproduction rate in 1931–2 shows that it was then about 1 87. It is impossible to say definitely how much it has decreased since, but it is safe to assume that in 1939 it was in the neighbourhood of 1·5. Some gross reproduction rates of other countries may serve as a comparison:

Bulgaria		Finland		England and Wales	
1901–10	3 20	1871–75	2 39	1870-72	2 34
1921–22	2 73	1921–22	1 57	1921–22	1 27
1930–32	1 86	1930–32	1 21	1930–32	0 93
1933–36	1 67	1939	1 22	1938	0 90

Source *Statistical Year Book of the League of Nations*, 1940–1, pp 46–7 (Geneva, 1941)

The gross reproduction rate of Greece was about as low in 1939 as it was in England and Wales in the years immediately preceding the war of 1914–18, but the proportion of females who had never married was much lower in Greece.

Net Reproduction Rate. As all the thousand women will not reach the age of 50, a further adjustment is necessary to turn gross rates into net rates. When allowance is made for deaths among the thousand women at successive ages between birth and 50, the resulting net rates are necessarily lower than the gross rates, the difference obviously being due to the mortality of women at different

ages. This corrected rate is known as the 'net reproduction rate'. If maintained, a net reproduction rate of 1 0 means that the population is likely to remain constant, for then the number of girls (future mothers) will be equal to the number of existing mothers (always provided that fertility and mortality rates do not change). If the rate is above 1, the population will increase If the rate is below 1, the population will decrease The rapidity of growth or decline is shown by the extent to which the rate differs from 1 0. A rate of 1·25 means that the population will ultimately grow by 25% every generation, while a rate of 0·75 means an eventual fall of 25% every generation

The lack of detailed statistical knowledge of the age composition of the female population since 1928, and of deaths in each year group, prevents an accurate calculation of the Greek net reproduction rate. A close estimate, however, shows that the rate in 1931–2 was about 1·25 Fertility has since decreased so much that, if mortality had remained constant, the net reproduction rate would have dropped by 1939 to unity But mortality had decreased also, and the net reproduction rate, while being lower in 1939 than in 1931–2, certainly was above 1. This rate is probably about as low as it was in England and Wales in the years immediately after the war of 1914–18, as the following comparisons show:

Bulgaria		Finland		England and Wales	
1901–10	1 82	1901–10	1 43	1880–82	1 57
1921–26	1 53	1921–30	1 07	1920–22	1 11
1930–32	1 27	1931–35	0 96	1930–32	0 81
1933–36	1 19	1938	0 96	1938	0 80

Source *Statistical Year Book of the League of Nations*, 1940–1, pp. 48–9 (Geneva, 1941)

Regional Variations in Growth

No administrative region in Greece has declined in population since the census of 1920, except for the small autonomous province of Áyion Óros (Mount Athos), which consists only of twenty monasteries On the other hand, the rate of growth has not been uniform throughout the country.

Fig. 10 shows the percentage increases of population by *nomoí* between 1920 and 1928, and to a large extent it records the distribution of refugees (compare with Fig. 106, vol. 1, of this Handbook).

Thus the large increases of over 30% in most of Makedhonía and Dhitikí Thráki indicate the partial repopulation of these regions after the war of 1916–18, and also the formation of refugee settlements on agricultural land. The *nomós* of Sérrai, drained by the Strimón, has benefited enormously from reclamation schemes and the splitting

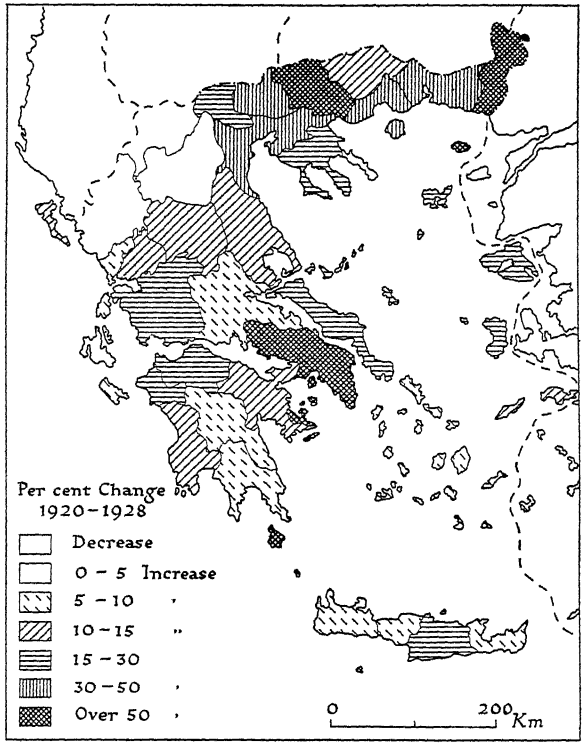

Fig 10 Increase of population by *nomoí*, 1920–8
Based on data in *Annuaire statistique de la Grèce*, 1931, p 28 (Athènes, 1932).

of large estates into small holdings. Most of the urban refugees came to Athens and its suburbs, and with the subsequent development of industries, the *nomós* of Attikí increased in population by over 50%. Less outstanding increases, on the plains of Kríti, Messinía, Ilía, Árta and Lárisa are also associated with refugee settlements and improved agricultural methods

The only regions where the population has remained static, or at most shows an increase of 5%, are on the mountains of Greece. In

these areas there were no refugee settlements, and the excess of births over deaths was almost counterbalanced by migration to the arable lowlands, to the towns, and overseas.

The growth of population through natural causes has been most pronounced in rural districts, partly because of a lower death-rate and partly because of a higher birth-rate when compared with municipalities. This is clearly shown in the following table for the census year 1928:

	Live-births		Still-born		Deaths		Excess of births	
	No	Rate	No	Rate	No	Rate	No.	Rate
Rural districts	134,186	31 9	1,105	0 3	66,162	15 7	68,024	16 2
Municipalities	55,064	27 6	806	0 4	39,503	19 8	15,561	7 8
State	189,250	31 0	1,911	0 3	105,665	17 0	83,585	13 5

Source: *Annuaire statistique de la Grèce*, 1931, p 58 (Athènes, 1932).

There is also a considerable variation from one region to another The excess of births over deaths has been consistently higher in north-eastern Greece than in the rest of the country during the last decade The table on p. 37 summarizes the population changes for each geographical region since the first Greek census. Preliminary results of the census of October 1940 show that the greatest increase has taken place in north-eastern Greece; the increase in Thessalía and Kritί is not very marked, and the population of the islands has remained fairly constant.

Towns and Cities

There are only three large cities in Greece, Athens (452,919 in 1928), Piraiévs (251,328) and Thessaloníki (236,524). A number of satellite towns, built or enlarged to house refugees, are grouped around Athens and its port, and together they form an urban agglomeration some 40 sq. miles in area (see p. 378). This is the only urban district in Greece comparable with those so characteristic of industrial Britain.

The provincial towns are for the most part small and compact, but around the kernel of all towns that have expanded in recent years is a suburban zone, openly built and often with a haphazard arrangement of houses. There is not, however, that ribbon development along roads so frequently found in western Europe. The large

Population Figures for each Dhiamérisma, 1839–1938

Census Year	Central Greece and Évvoia	Pelopónnisos	Kikládhes	Ionian Islands	Ípiros	Thessalía	Makedhonía	Krítı	Aegean Islands	Dhitikí Thrákı	Greece
1839	268,926	444,694	110,153	—	—	—	—	—	—	—	823,773
1848	340,397	509,921	136,413	—	—	—	—	—	—	—	986,731
1856	372,349	551,899	138,379	—	—	—	—	—	—	—	1,062,627
1861	410,070	568,610	118,130	—	—	—	—	—	—	—	1,096,810
1870	459,332	635,516	123,299	197,987	20,892	—	—	—	—	—	1,457,894
1879	557,179	733,394	132,020	208,091	23,083	—	—	—	—	—	1,679,470
1889	680,025	803,038	131,508	212,765	58,908	300,964	—	—	—	—	2,187,208
1896	768,496	892,070	134,747	223,081	69,036	346,376	—	—	—	—	2,433,806
1907	909,322	925,817	130,378	225,023	70,751	370,661	—	—	—	—	2,631,952
1913	†	†	†	†	245,618	†	1,167,617	336,151	305,915	—	4,819,793
1920	1,136,183	934,034	122,347	198,070	292,954	438,408	1,085,531	346,584	260,058	202,660	5,531,474
1928	1,592,842	1,053,327	129,702	213,157	312,634	493,213	1,412,477	386,427	307,734	303,171	6,204,684
1938*	1,799,169	1,185,046	146,987	231,510	363,041	562,020	1,686,479	441,687	337,986	354,889	7,108,814

Source *Annuaire statistique de la Grèce*, 1932, pp 32–4 (Athènes, 1933); *ibid*, 1939, p. 30 (Athènes, 1940)

* The figures for 31 December 1938 are official estimates.
† There was no census in this year for the provinces of 'Old Greece'

towns of the interior are few in number and are generally on the edge of a plain, where they serve as market centres. The other towns are ports, which are engaged in coastwise traffic and which have gathered to themselves a few small-scale industries.

According to the census of 1928 there were then only twenty towns with a population of over 20,000. Six of the largest—Piraiévs, Thessaloníki, Pátrai, Kaválla, Vólos and Kalámai—are ports of the mainland; another six are island ports, Iráklion, Kérkira, Mitilíni, Khaniá, Khíos and Ermoúpolis (Síros), and of these, the last five are island capitals. These twelve ports are described in Chapter VIII.

The inland towns, except for Athens and its refugee suburb of Kallithéa, are all in the north. They are, in order of size, Xánthi, Komotiní, Sérrai, Dráma, Lárisa and Ioánnina, and are described in Appendix I, p 382. They are either administrative or commercial centres, often both together; a number have manufacturing establishments and a few have military garrisons. In general the populations of the inland towns vary with the size of the plains on which they stand—the larger the plain the larger the town. This is true not only for places of over 20,000 inhabitants, but for most of the small towns of Greece The chief exceptions occur where there are rival towns on the same plain.

The populations of the remaining urban centres in Greece are classified by administrative function into demes (*dhímoi*) and communes (*koinótites*) irrespective of their size (see p. 256, vol. I of this Handbook). In 1928, there were thirty-five demes with between 5,000 and 20,000 inhabitants; and, in this year, there were forty communes with between 5,000 and 20,000 inhabitants In all, these demes and communes together account for 10% of the total population of Greece The character and aspect of most Greek towns is very similar. They are the homes of agricultural workers and of those who carry on the essential trade of a dominantly agricultural community. The chief exceptions are the smaller seaports. The towns and villages are usually closely built, but there is no rigid plan except in the new refugee settlements, which are monotonous agglomerations of uniform cottages built on a grid system.

The rise of the leading towns at successive periods is given in the table on p. 39, and the growth of Athens, Piraiévs and Pátrai is shown in Fig. 11 Population figures are taken from Greek censuses, except for those of 1937, which are estimates The table clearly illustrates the large number of towns in the new provinces of Greece, and the phenomenal rise in population which took place after 1920.

Growth of Towns with over 20,000 *Inhabitants* (1853–1937)

Town	1853	1856	1861	1870	1879	1889	1896	1907	1920	1928	1937*
Athens	30,590	30,969	41,298	44,510	65,499	110,262	123,001	167,479	292,991	452,919	494,080
Piraiévs	5,434	6,057	6,452	10,963	21,618	34,327	50,200	73,579	133,482	251,328	284,070
Thessaloníki	—	—	—	—	—	—	—	—	170,321	236,524	264,960
Pátrai	15,854	15,131	18,342	16,641	25,494	33,529	37,985	37,724	52,174	61,278	73,310
Kaválla	—	—	—	—	—	—	—	—	22,939	49,980	54,980
Vólos	—	—	—	—	—	11,029	16,788	23,563	30,046	41,706	50,680
Xánthi	—	—	—	—	—	—	—	—	16,584	33,712	37,290
Iráklion	—	—	—	—	—	—	—	—	24,848	33,404	43,040
Kérkira	—	—	—	15,452	24,420	27,633	28,371	28,524	27,175	32,221	34,770
Komotiní	—	—	—	—	—	—	—	—	21,294	30,136	32,380
Sérrai	—	—	—	—	—	—	—	—	14,486	29,640	32,030
Kallithéa	—	—	—	—	—	—	139	1,270	4,185	26,603	30,560
Dráma	—	—	—	—	—	—	—	—	15,263	29,339	35,120
Kalámai	3,492	4,526	6,292	6,327	8,109	11,132	15,200	15,939	20,965	28,955	32,870
Mitilíni	—	—	—	—	—	—	—	—	18,314	27,870	34,310
Khaniá	—	—	—	—	—	—	—	—	24,976	26,604	36,420
Lárisa	—	—	—	—	—	13,610	15,373	18,001	21,084	23,899	27,190
Khíos	—	—	—	—	—	—	—	—	14,006	22,122	27,880
Ermoúpolis	19,981	16,830	18,511	20,996	21,540	22,104	18,760	18,132	18,663	21,150	22,620
Ioánnina	—	—	—	—	—	—	—	—	20,765	20,485	20,540

Source (i) *Annuaire statistique de la Grèce*, 1932, pp 35–7 (Athènes, 1933), (ii) *Bulletin mensuel de statistique, Décembre* 1938, p. 39 (Athènes, 1939)

* The 1937 figures are population estimates for demes, and therefore include the people of surrounding villages

Although detailed results of the census of October 1940 are not available, preliminary figures show a great increase in the urban population. In the Athens-Piraiévs district, for example, the population is given as 1,125,000, and that for the deme of Thessaloníki as 575,000.

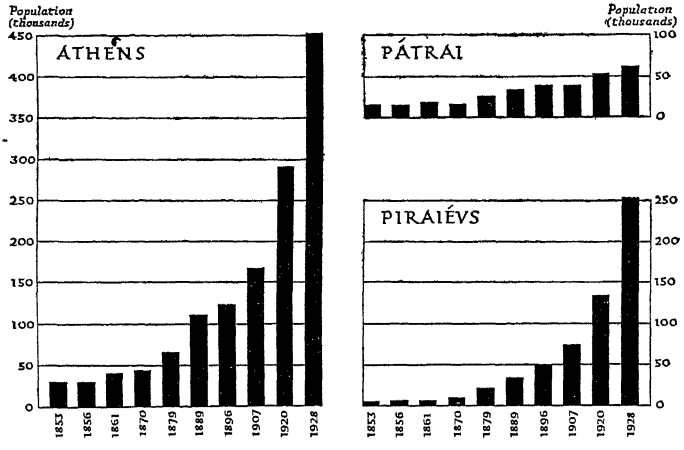

Fig 11 Growth of Athens, Piraiévs and Pátrai, 1853–1928

Based on data in *Annuaire statistique de la Grèce*, 1932, pp. 34–7 (Athènes, 1933)
Thessaloníki, the third largest city in Greece, only became Greek in 1913

Rural Settlement

The economic transformation of Greece has reduced the proportion of the rural population living in settlements of less than 2,000 inhabitants from 72% in 1879 to 63% in 1920 and then to 58% in 1928. On the other hand, the larger villages, or small towns, with from 2,000–5,000 inhabitants, have been the homes of 9% of the population for the last sixty years. Dispersion of the population in scattered dwellings is extremely rare, and the typical settlement in rural Greece is the nucleated village, that is, the clustering of houses into compact groups standing alone in wide stretches of open land. Sometimes, of course, where water is plentiful, the commune may consist of one large village and a number of surrounding hamlets, but real dissemination is exceptional.

The result of this type of settlement is that villagers frequently have to travel a long way from their homes in order to make use of different kinds of land. One often finds, therefore, a group of houses

or huts, called *kalívia*, which are occupied only for short periods during the year. The huts of a low-lying village may be on high mountain pastures, and those of an upland village near its lowland vineyards. Similarly, around ill-drained plains, as for example on the solution-hollows of the limestone in Arkadhía, the permanent villages are placed well up on the slopes to avoid malaria, while scattered huts on the plain shelter the people when working there in safer periods. These *kalívia* may be several days' journey from the village. In some instances the villagers remain there for the greater part of the year, only returning to their old homes during the malarial season, and, occasionally, they abandon the original settlement altogether. The huts of the *kalívia* are changed into stone houses, a church is built, a general stores is added, and the temporary settlement becomes permanent.

Similar huts are often to be found near beaches backed by flat, marshy land. They act as small ports for craft engaged in fishing or local trade, and they serve the needs of villages standing on the drier and firmer land several miles from the coast. Usually, as on the western shores of the Gulf of Thérmai, they are called *skála* (small port) followed by the name of the village which they serve. Thus Skála Leptokariás serves Leptokariá, some 3 miles distant, Skála Litokhórou serves Litókhoron, 4 miles to the south-west, and there are many such examples. The fact that villages are not common on the coasts of Greece, as elsewhere in the Mediterranean, has been attributed to the danger from piracy in the past. Similarly, it is said that insecurity is responsible for the absence of isolated dwellings inland; but additional reasons in both cases are related to water supply, malaria, and the ancient 'city' tradition of Greece.

One interesting type of settlement in hilly districts can be found in the innumerable pairs of villages throughout the country, prefixed by the words *áno* (upper) and *káto* (lower). They are complementary to one another and both are permanently inhabited, although the population of each varies from season to season. Usually they stand on the upper and lower slopes of a valley and illustrate the differences in agricultural opportunities at various levels (see p. 50).

Villages, like the towns, bear the mark of their past history, and a village that originated in the *Tchiflik* (home of a bey and his dependants) still shows the influence of Turkish architecture and plan. It is largely confined to the plains of Thessalía, Makedhonía and Dhitikí Thráki. The *Tchiflik* consisted of one or more squares within mud or brick walls capped by tiles. Behind the walls was

a line of single rooms that used to be occupied by serfs and their families, and within the square stood the house of the bey, his *haremlik* and other separate buildings. These larger houses have usually survived, and the ground plan and sometimes the outer walls of the settlements may still be traced in the modern, compact village. Other Greek villages are simply aggregations of houses laid out to suit the site and converging roads. On the plains there is a tendency to build on a grid plan, around a large market-place. Hill-side villages are often sprawling in character and suggest gradual and unplanned growth except about the centre. Others occupy astonishingly bold sites, which were clearly chosen for reasons of defence.

Water supply is a leading factor in the location of villages and consequently there is a marked contrast between the number and disposition of villages in limestone regions and those on less permeable rocks. Perennial springs in limestone are usually widely separated, and so consequently are the villages. On the other hand, the spring line at the junction of limestone and impermeable rocks normally attracts a large population. On the large plains, where wells reach water anywhere, the villages are evenly spaced on ground that is free from floods; on the smaller plains the margins are more favoured, and settlements are common on alluvial fans or dissected terraces, where water can easily be controlled for local irrigation.

Foreign Population

The main facts about the foreign population of Greece are summarized in the table on p. 43. Turks and Italians account for over 50%, and nationals of the surrounding Balkan states for a further 20%. This foreign element must not be confused with the minorities within Greece, who form 7% of the total population and differ from the Greeks in race, language or religion (see Chapter XII, vol. I, of this Handbook). There has been no radical change in the composition of the foreign population during the last fifty years, except for the steadily increasing number of Italians interested in Greek trade. Greece attracts no industrial workers and few labourers to her fields. Commerce and the numerous foreign schools of archaeology largely account for the nationals of western European countries in Athens and the leading ports, while others have been engaged as technical advisors in industry and drainage works.

Foreign Population, 1870–1928

Country of origin	1870	1879	1907	1920*	1928
Turkey	15,051	23,133	27,371	33,319	22,373
Italy	1,539	3,104	6,382	10,970	14,598
Albania	—	—	—	5,605	7,193
Britain	2,099	2,187	3,280	3,393	6,908
Jugoslavia	—	—	—	5,536	4,797
USA	24	34	87	923	3,692
Russia	141	101	446	6,165	3,329
France	415	534	1,122	1,503	2,367
Germany	526	314	1,173	671	1,429
Bulgaria	—	50	4,873	2,348	1,283
Roumania	—	54	142	653	1,106
Others	163	2,458	4,531	1,995	4,263
Total	19,958	31,969	49,407	72,991	73,338
% of total population of Greece	1·4	1·9	1·8	1·3	1·2

Source *Annuaire statistique de la Grèce*, 1930, pp. 101-2 (Athènes, 1931)

* Within the frontiers of the Treaty of Lausanne

Conditions since October 1940

The population of Greece at the end of 1942 was officially estimated to be 7,200,000. The normal increase due to the balance between births and deaths has therefore been more than offset by war casualties, deaths from starvation, and the migration of Greeks to foreign countries. It must be noted, however, that available data on population movements in Greece are vague, and for the most part unreliable and contradictory.

Refugees from Greece

During the war with Italy (October 1940–April 1941) the civil Greek population remained at home, but the short and disastrous war against Germany provoked a considerable stream of refugees This movement started in Makedhonía and Dhitikí Thráki, and as early as 11 April 1941, it was reported that 12,000 Greek soldiers and 20,000 Greek civilians had taken refuge in Turkey These figures are most probably over-estimates. The exodus continued after the occupation of Greece by the Axis armies, especially from the Aegean islands and from Kríti. A conservative estimate of the number of

Greek refugees abroad in March 1943 was given by the Greek Office of Information in Washington as 12,695, divided as follows.

Cyprus	5,000	Egypt	1,330
Syria	1,900	Kenya	480
Belgian Congo	1,825	Tanganyika	400
Turkey	1,450	Palestine	310

In addition there are probably one thousand Greeks on Mauritius, and several thousands scattered over various parts of the world. Thus the total number of civilian Greek refugees abroad may be estimated at 20,000.

Transfer of Workers from Greece

A German campaign to induce Greeks to 'volunteer' for work in Germany was introduced in the autumn of 1941, but, despite the shortage of food at home, the campaign met with little initial success. Stricter measures were introduced early in 1942 and by August the Germans announced that there were 8,000 Greek workers in Germany. Many of these were women. It is also reported that the Bulgarian government transported some 3,000 Greeks from Dhitikí Thrákı to Bulgaria, where they were engaged in forced labour near Plovdiv. A similar number were sent to concentration camps on the island of Samothrákı.

Deportation of Jews

The Jewish population in Greece at the time of the 1928 census numbered 72,791, of whom more than half lived in Thessaloníki and most of the remainder in Makedhonía and Dhitikí Thrákı. The first deportation of Jews took place in March 1943, when it was stated that 3,500 Jews from Thessaloníki were sent to a concentration camp in Lwow. By the end of May it was estimated that only 5,000 Jews, who held either Turkish or Spanish passports, remained in Thessaloníki. The Bulgarian government also carried out wholesale deportation of Jews to Poland from eastern Makedhonía and Dhitikí Thrákı. At the end of May 1943 some 14,000 had been deported from these regions.

Movement of Population into Greece

On 10 October 1941 a Bulgarian decree was issued which provided for the colonization of the area between the rivers Strimón and Néstos, and in July 1943 the Bulgarian prime minister declared that 'the greater part of the 150,000 Bulgarians in Thrace, who had

evacuated their country at the end of the war of 1914–19, have returned to their original home'. This number greatly surpasses the number (92,000) of Bulgarians who left Thrace after 1919 (see vol I, p. 375, of this Handbook). Doubtless, under the slogan of 'repatriation', thousands of Bulgarians who had nothing in common with Thrace were moved into this area. In all, it is estimated that from 80,000 to 100,000 Bulgarians have settled in the occupied Greek provinces.

It is not known how many German civilians have arrived in Greece, but probably the greatest proportion are German industrialists and officials living in Athens. The number who have been evacuated from the Rhineland and other German cities is thought to be small.

Movement of Population within Greece

By far the greatest migration of Greeks has been from north-eastern Greece. In April 1943 the Bulgarian occupation authorities issued an order by which all Greeks who did not declare themselves Bulgarians by the following November were to evacuate the Bulgarian-occupied Greek provinces The movement, under pressure, had started long before this and by the end of 1942 it was stated that some 100,000 Greeks had already been evicted Many of them moved into German-occupied western Makedhonía, southern Greece, and eastwards into the *nomós* of Évros.

There has also been a considerable movement, again under pressure, from strategically important areas. Thus the population of the coastal areas of Attikí is said to have been transferred to the interior of Voiotía, while the villages along the Athens-Thessaloníki railway have been evacuated. An effort was also made to settle many town dwellers, especially children, in rural districts, in order to relieve the food shortage in the cities. It is stated, however, that there has been no noticeable migration to the countryside, even from Athens, where the mortality rate due to famine has been high.

Bibliographical Note

1 A census of the population of Greece was first made in 1828, and was repeated at irregular intervals until 1940 During this period twenty-one censuses have been taken, ten of which fell between the years 1828 and 1848 Detailed results of the latest census, October 1940, have not been published, and that of May 1928 still remains the most up-to-date The findings of this census have been published by the Greek Ministry of Economics, *Population de la Grèce d'après le recensement du 15–16 Mai* 1928 (Athènes, Deuxième Edition, 1935). In this work place names and table headings are given in Greek and French

Estimates of the total population are available for each year since the foundation of the modern Greek state (1821). These are given, together with a short summary of the 1928 census, in the *Annuaire statistique de la Grèce* (Athènes, annually) The population in each of the principal demes and communes is published in the *Bulletin mensuel de statistique* (Athènes, monthly).

2 The *Statistical Year Book of the League of Nations* (Geneva) provides comparative population data for Greece and other countries, and gives also much information about fertility and reproduction rates For further details on gross and net reproduction rates see R R Kuczynski, *The Measurement of Population Growth* (London, 1935) Comparative data for different countries can also be obtained from *Aperçu de la démographie des divers pays du monde* (Hague, annually)

3. Little information has been published on the regional distribution of population in Greece The fullest account is J Sion and Y Chataigneau, *La Méditerranée et les Péninsules Méditerranéennes* (Paris, 1934), which forms vol VII, part 2, of the *Géographie Universelle* A paper by A G. Ogilvie, 'Population Density in Greece', in the *Geographical Journal*, vol CI, Nos 5, 6 (London, June 1943) discusses the regional variations in population densities according to the census of 1928 It is illustrated by a map on a scale of 1 1,750,000

A detailed bibliography of the settlement of refugees in Greece is given on p 396, vol I of this Handbook

4 Greece offers an interesting field for the study of types of rural settlement, but as yet little work has been done on this subject. A start has been made by J Cvijić, *La Peninsule Balkanique Géographie Humaine* (Paris, 1918)

5. A book by E M Kulischer, *The Displacement of Population in Europe* (Montreal, 1943), gives further information

Chapter II

AGRICULTURE

General Features Government Policy and Legislation The Major Crops: Fruit Growing Livestock. Forestry Conditions since 1941: Bibliographical Note

General Features

Agriculture is the chief occupation of the people of Greece, employing well over three-fifths of the total population. This proportion is lower than those for the neighbouring Balkan countries, where maritime activities, commerce and industry are not so well developed, but it is twice as great as those in Western Europe. Moreover, the trade and industries of Greece depend almost entirely upon the products of her soil, and efficient cultivation is therefore of paramount importance in the economy of the country.

There are only 9,324 sq. miles of cultivated land in Greece, representing approximately one-fifth of the total surface, or one sq. mile for every 750 inhabitants: it is obvious, therefore, that the country cannot be self-supporting in foodstuffs. The rest of Greece, except for a part of the forest-lands, is largely the domain of domestic animals, mainly sheep and goats, which hinder the growth of woodland without materially adding to the fertility of the farm-land. Thus there is a fundamental separation between arable and fruit farming on the one hand, and stock-keeping on the other, in marked contrast with Britain, where the field crops, the small orchard and livestock are intimately related on the same farm. In recent years, however, the separation in Greece has been slowly growing less distinct (Plate 20).

The herdsmen of the past were nomads, and flocks are still moved over the considerable distances that separate summer and winter pastures. Pigs, too, are generally roaming animals and are not kept in farms; they are relatively few, and are kept for slaughter in the winter months Stock-keeping, in the few places where it is based on a farmyard, is chiefly confined to the larger animals: these are cattle and buffaloes, horses, mules and asses (all used for work), and, in small but increasing numbers, dairy-cattle near the large towns.

Most of the arable land is divided into small holdings worked by peasant proprietors; their chief aim is to provide food for themselves and their families, and to a northerner their demands seem singularly

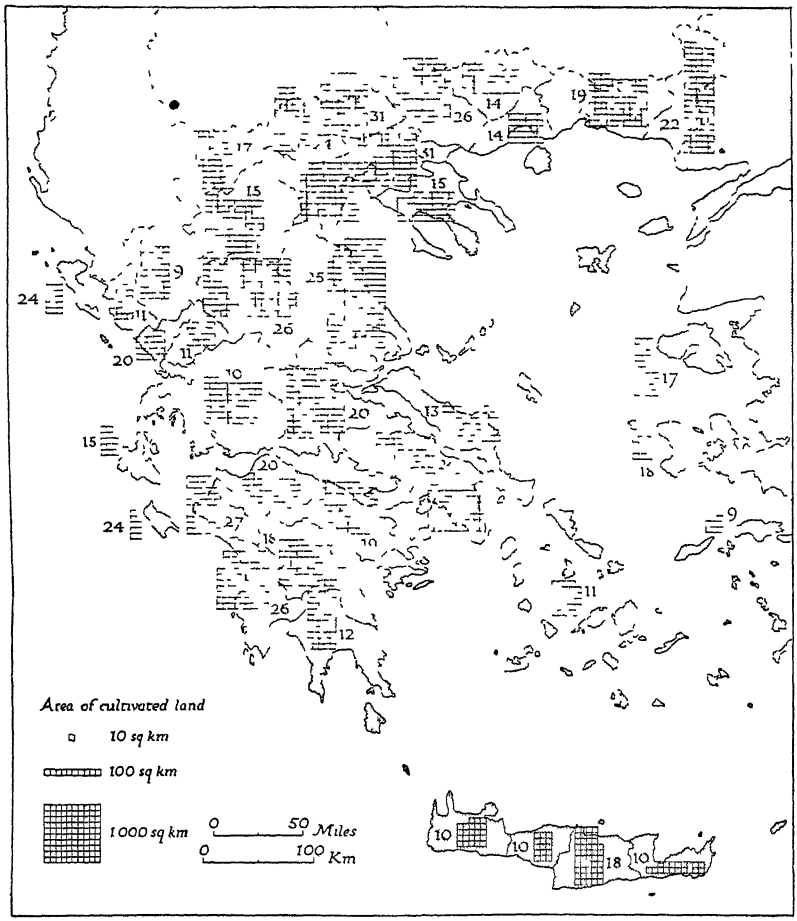

Fig 12 The area of cultivated land in Greece, 1937
Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, p 52 (Athènes, 1938)
The squares show the area of cultivated land in each *nomós* and the numbers express this area as a percentage of the total land surface in each *nomós*

small. Bread, wine and olives, together with a variety of fresh and dried vegetables, and the milk and cheese of goats and sheep make up the staple diet. Occasionally these may be supplemented by fruits, honey and fish: meat has never been greatly eaten, and beef

still finds no place in the diet of most inhabitants; but animal suet, chiefly mutton, is sometimes a partial substitute for olive oil. To this subsistence agriculture have been added certain commercial crops, notably currant-grapes, tobacco, cotton, and mulberry leaves upon which the silkworm is fed.

Farming Methods

Agricultural practices, except in irrigated areas, are still largely primitive. Farmers customarily raise their crops without the help of animal manure, other than what little may be gained from beasts browsing on the stubble. Their ploughs are, in many parts, of the ancient wooden kind armed with an iron point, so that only some six inches of soil are affected: this shallow ploughing retains more of the moisture of the soil in the dry, hot summer, than does modern ploughing, but it fails to clear the weeds. Not only the plough, but other implements too are of the simplest kind. Thus threshing is often done with the flail, or by the hooves of animals on a floor of beaten clay; but more commonly the ancient *tribulum* is used, a wooden sledge fitted below with teeth of stone or metal, which is hauled round and round the floor under its driver's weight. Winnowing, again, usually consists of throwing the grain in the air with a wooden shovel. Modern machinery, however, for ploughing, sowing and threshing is rapidly finding a place, particularly on the plains of north-eastern Greece. The old methods associated with an extensive type of farming are in varying degrees retained through various factors such as lack of capital, lack of instruction, low prices fetched by many field-crops, and the traditional separation of stock from arable husbandry.

In the past, the system of cropping was often dictated by sheer necessity and not by scientific considerations. The old system had been to grow grain on a given field every other year, alternating with fallow. but as suitable land became scarce, this was replaced by a two-course rotation, with or without a fallow year according to the space that was available Thus, wheat may be followed by barley, but preferably by a summer crop, usually maize, sesame or tobacco, or by a leguminous crop. Any of these is better than a second small-grain crop, not merely for chemical reasons (such as are obvious, for example, with a leguminous crop) but because for sesame the soil must be specially prepared, for maize and tobacco the field must be hoed, and for tobacco manure is needed.

The allotting of land to different crops is, in most parts of Greece,

founded on very long experience, though it is affected to some extent by the modern problem of transporting produce. Apart from this consideration, the main factor is that of rainfall, its available quantity, its distribution throughout the year, and its reliability But cultivation responds also to temperature, and hence to altitude and to distance from the sea; and the typical Mediterranean agriculture, like the natural vegetation, is found mainly on the coastal lowlands and the islands. It is characteristically a dual type of agriculture: it depends, firstly, on annual crops whose period of growth coincides with the rainy season, the half of the year which includes the winter; and, secondly, on perennial fruit-trees and shrubs whose root and leaf systems are so adapted that during the dry summer they can draw upon the meagre supplies of water still contained in the deeper soil and subsoil. The first class occupies more than two-thirds of the whole cultivated area, and includes the cereals, the leguminous crops, and some vegetables; the second class includes the olive, vine, fig and some other fruits. The annual crops grow with the winter rains and are harvested before the drought sets in; the others survive the drought and ripen their fruits during the autumn. Plants which demand at one and the same time much water and a high temperature would clearly be altogether excluded, if it were not that some parts of the country are naturally ill-drained, or for special reasons keep moisture in the soil for an unusually long time, or lend themselves to artificial irrigation In these areas, cotton, maize, millet and sesame are grown, and, chiefly in the Pelopónnisos and Ípiros, rice; the raising of vegetables becomes much more important and varied; the orchards include deciduous fruits and, where there is plenty of water for irrigation, citrus fruits, especially oranges. The mulberry tree, cultivated for its foliage, is also confined to land which is by nature damp. In countries where stock-feeding bulks large, such damp land is much used for forage crops. In Greece, little land has been fit for this in the past; but in the newly-irrigated tracts of Thessalía and Makedhonía fodder rapidly grown in the hot weather, as it is in northern Italy, may be expected to play a greater part.

Government Policy and Legislation

In the last twenty years Greek agriculture has changed more rapidly than ever before, for two primary reasons. In 1923, Greek territory was extended in part beyond the region of strictly Mediterranean climate, and the typical crops of this area were somewhat

different from those of Old Greece: there were few olive trees for instance, but the best tobacco in Europe. These lands had mostly been held as large estates by Turkish beys or by monasteries, whereas in Old Greece small holdings owned by peasants were almost universal. Secondly, the large refugee population suddenly arrived from Turkey and the neighbouring countries, and was mainly settled on the old estates and malarial lowlands of New Greece. Moreover, most of the Moslems and Bulgarians who left Greece under the exchanges of population were from Makedhonía, and thus the large estates (*Tchifliki*), formerly in the ownership of the Turkish ruling class, were now available for occupation by peasant proprietors. The government at once began to take an interest in scientific farming and agricultural instruction, but two major problems had first to be solved. Vast operations of draining, reclaiming and partial irrigation were imperative if full use of the land was to be made and malaria, from which the refugees suffered soon after their arrival, was to be reduced. Secondly, small holdings had to be created in order to make the most satisfactory use of the land (Plate 18).

There were three great areas of land reclamation in the new provinces, while works of similar nature were also carried out in Thessalía. The first was in the Kambánia of Thessaloníki, partly along the lower Axiós valley and partly in the lower Aliákmon basin, both of which were related hydrographically with the draining of Lake Yiannitsá. The second area comprised the swamps of Filíppoi (Philippi) and those of the lower Strimón, including Lake Akhinós; and these two again, though separated by the Pangaíon mountains, both belong to the basin of the Strimón. Finally, in Ípiros, the largest tracts reclaimed are in the deltaic plain of Árta, involving the rivers Árakhthos and Loúros and the lower valley of the river Akhéron In the drainage basin of the Piniós in Thessalía similar works of irrigation were accomplished, not for the accommodation of refugees, but to bring more land under cultivation. The effects of these changes were to increase greatly the area of cultivated land. In the period 1923–31, the area put under the plough in Makedhonía, Dhitikí Thráki and Ípiros was more than doubled. Yet the Pelopónnisos too, with few refugees and no great reclamations, showed an increase of 42%, and Central Greece and Évvoia one of 24% (Plate 19) In most of the islands, including Kríti, there was little room for extension.

Greece had already been confronted with the problem of land

tenure when it acquired Thessalía in 1881, and Makedhonía and Ípiros in 1912. It was then recognized that the only radical solution of the agrarian problem was the expropriation of the large estates, but the economic and national crises of war kept the country under arms for ten years and little could be done throughout this period to better the conditions of the peasants. A multitude of laws and decrees were passed from 1916 onwards, and finally the reform was systematized into a Codified Agrarian Law of 15 October 1926 consisting of 155 articles. The measures were not entirely the result of a smooth evolutionary process. Many battles were fought at public meetings and in parliament; one conflict at least, in the plain of Thessalía, led to bloodshed.

The main provisions of the law were that no private land should be held by 'absentee' landlords, and that no one should be allowed to hold personally an area of more than 25 acres of cultivated land in Thessalía, Makedhonía, Ípiros and Dhitikí Thráki, or of 75 acres in the rest of Greece. There were, however, certain exceptions: plantations, woods and forests, the land owned by large industrial establishments, and pasturage indispensable to peasants and not capable of cultivation were not expropriated; a few of the larger farms were also exempt, because they were considered as model farms to which certain obligations were attached, namely, to employ the latest methods of farming, to lend themselves to experiments, and generally to assist the state in propagating modern husbandry. Indemnities were paid to expropriated landowners on the basis of values existing before the war of 1914–18. Between 1917 and the end of 1925, some 1,500 estates had been taken over and 45,000 families settled on them. The work of expropriation was almost completed by 1939, when the average holding for the whole of Greece was some 7 acres, an area not unduly low for Balkan countries.

Critics of the reform laws have urged very strongly that the division of self-contained estates into small holdings puts up the cost of production and makes it difficult to apply mechanization to agriculture. For Greece, this objection holds good, but it has been offset in some degree by counter-measures. Of these the chief were the provision of a co-operative movement and the establishment in 1928 of a state agricultural bank, which gave well-directed financial aid to the farmers (see pp. 182–91).

Government attention was not restricted to these measures, for the economic crises that affected the world during 1922–33 made it necessary increasingly to supervise agricultural production in Old

Greece as well. Thus, in some districts local crises were caused by excessive concentration of effort upon commercial crops to the detriment of the cereals essential to the nation Dependence upon foreign markets for such crops as tobacco and currants involved great risks; hence, among other reasons, the Greek government

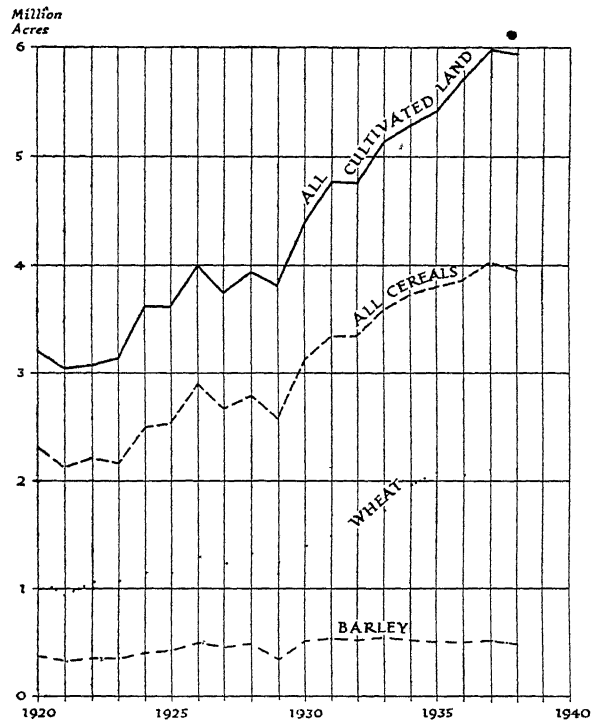

Fig. 13 The increase in area of cultivated land in Greece, 1920–38

Based on data from *Annuaire statistique de la Grèce*, 1939, pp 436–40 (Athènes, 1940)

The acreage under all cereals and especially under wheat increased rapidly between 1920 and 1938 The production of barley throughout this period remained fairly constant, most of the assistance given to the farmers by the government was for the growing of wheat

embraced the policy of fostering the cultivation of wheat, and the decade preceding 1939 witnessed something comparable to the 'grain battle' fought by the Italian government (Fig. 13). The success of this campaign was very largely due to the land reclamation schemes, to the introduction of new types of wheat, to the scientific combating of crop diseases, and to more intensive use of the land.

Legislation was also passed to restrict the growth of cash crops, to control marketing, and to maintain a high quality of produce. From 1928 onwards experiments in rural education, agriculture and hygiene were carried out by the Near East Foundation among the refugees of northern Greece. Though quite small and local they were so valuable that the government adopted their methods and applied them to other parts of Greece.

To sum up, the 1920–40 period marked a transition from the old, traditional and, in many respects, backward practices of agriculture and stock-keeping, some of them of remote origin, to modern European or American methods that had to be adapted to the local conditions. Such changes could only be brought in gradually, if for no other than financial reasons; yet much had been accomplished before the catastrophe of 1940, and Greece had embarked on an agricultural policy which would have led eventually to the best use of her restricted agricultural land.

The Major Crops

In 1937 the area of cultivated land was 9,324 sq miles, or 18·5% of the total surface of Greece (Fig. 12). Figs. 14 and 15 show the proportions under particular crops, but it must be remembered that much of the land devoted to fruit-growing is not classified as cultivated,

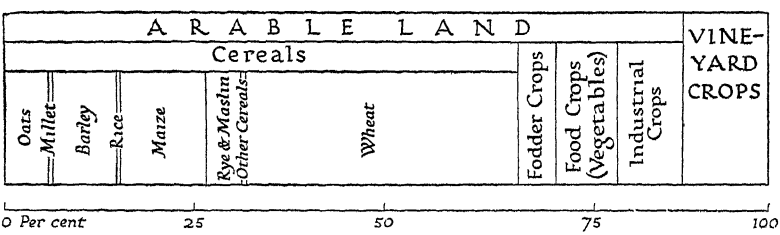

Fig 14. The percentage of cultivated land under all crops

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, p 3 (Athènes, 1938).
The widths of the columns representing the percentage of land under millet —0 10%, rice—0 08% and other cereals —0·14%, have been exaggerated for clarity.

although olives and orchards provide a valuable source of food and income to the Greeks. It was estimated that olive groves occupied some 2,000 sq. miles of country in 1937, and orchards of other fruits a further 400 sq. miles. Cereals were by far the most important crops, utilizing 67 4% of the cultivated land, of which over half was devoted to wheat The table on p. 55 gives the relative value of the five

chief corn crops for the years immediately preceding the effective reclamation of land in northern Greece, and the corresponding figures for the five-year period after the improvements had been made.

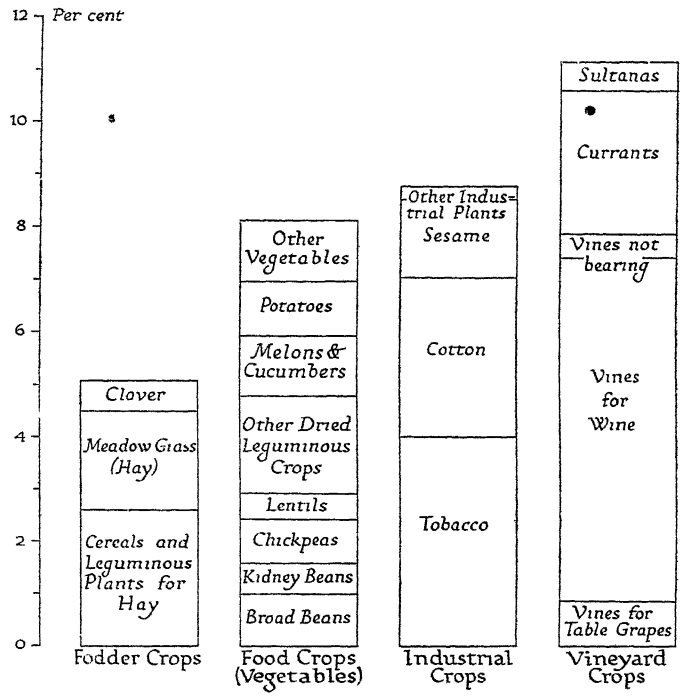

Fig 15 The percentage of cultivated land under certain crops

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, p. 3 (Athènes, 1938).

Production of cereals in Greece

Crop	Averages 1926–30				Averages 1933–37			
	Area (1,000 acres)	Percentage of cult area	Harvest (m tons)	Yield (cwts per acre)	Area (1,000 acres)	Percentage of cult. area	Harvest (m tons)	Yield (cwts. per acre)
Wheat	1,300	33	342,420	4 9	1,987	36	712,000	7 1
Barley	472	12	151,204	7 2	525	10	198,300	7 4
Maize	414	10	143,155	6 2	623	11	256,856	8 0
Oats	279	7	68,354	5·1	339	6	112,352	6 5
Rye	131	3	40,729	6 1	175	3	59,296	6·7

Source *Annuaire statistique de la Grèce*, 1938, pp 438–9 (Athènes, 1939.)

The non-cereal crops of ploughland are statistically distinguished as 'fodder', 'food' and 'industrial and aromatic' crops, but together they occupy only some 2,000 sq miles, or 21·6% of the total cultivated area. Industrial crops include notably tobacco, cotton and sesame.

Wheat

For many centuries, wheat has gradually been usurping the place of barley as the chief cereal of Greece and the most favoured component of her people's diet. Yet the Greece of modern times was for long, and especially just after the arrival of the refugees from Turkey, very far from growing the grain for her own bread. The harvests yielded between 1922 and 1930 amounts varying from 210,000 to 370,000 m. tons, and in 1931 some 306,000 m. tons were grown at home and 663,000 tons of wheat and flour were imported. In this year there was only one sq. mile of cultivated land for every 870 inhabitants, manifestly insufficient to support the people. But there were other causes for the low output: farmers in general devoted too much attention and space, until the government controlled them, to more remunerative commercial crops which occupied the labour of many more hands for the same area of land, and which produced the credits for the wheat that had to be imported. Moreover, the prevailing average yield of wheat was low: in 1922 this was only 4·5 cwts per acre, which compared adversely with those for the United States (7·9 cwts), Canada (9·5 cwts), France (11 1 cwts), Germany (15 0 cwts), Great Britain (17 5 cwts) and Denmark (22 cwts).

From 1925 onwards, experiments in scientific selection of seeds were made at the Research Institute in Thessaloníki and at its dependent establishments in Makedhonía, Thessalía and Kríti. These sought chiefly to combat the effects of drought, the lodging (laying flat by weather) of corn crops, and the black rust disease. Selective breeding from the many varieties of Greek wheat led in ten years to greatly increased yields, up to 40% in some areas (see table on p. 58). This was chiefly in the hard wheats of southern Greece and the islands. Another innovation was to bring in seeds from many foreign countries where climates were similar: one good result, notably with the *Mentana* variety, harvested late in May, was earlier ripening, before the dry season. The crossing of foreign with local varieties brought more improvements. By reclamation, by substituting wheat for barley where it was possible, by plant-breeding

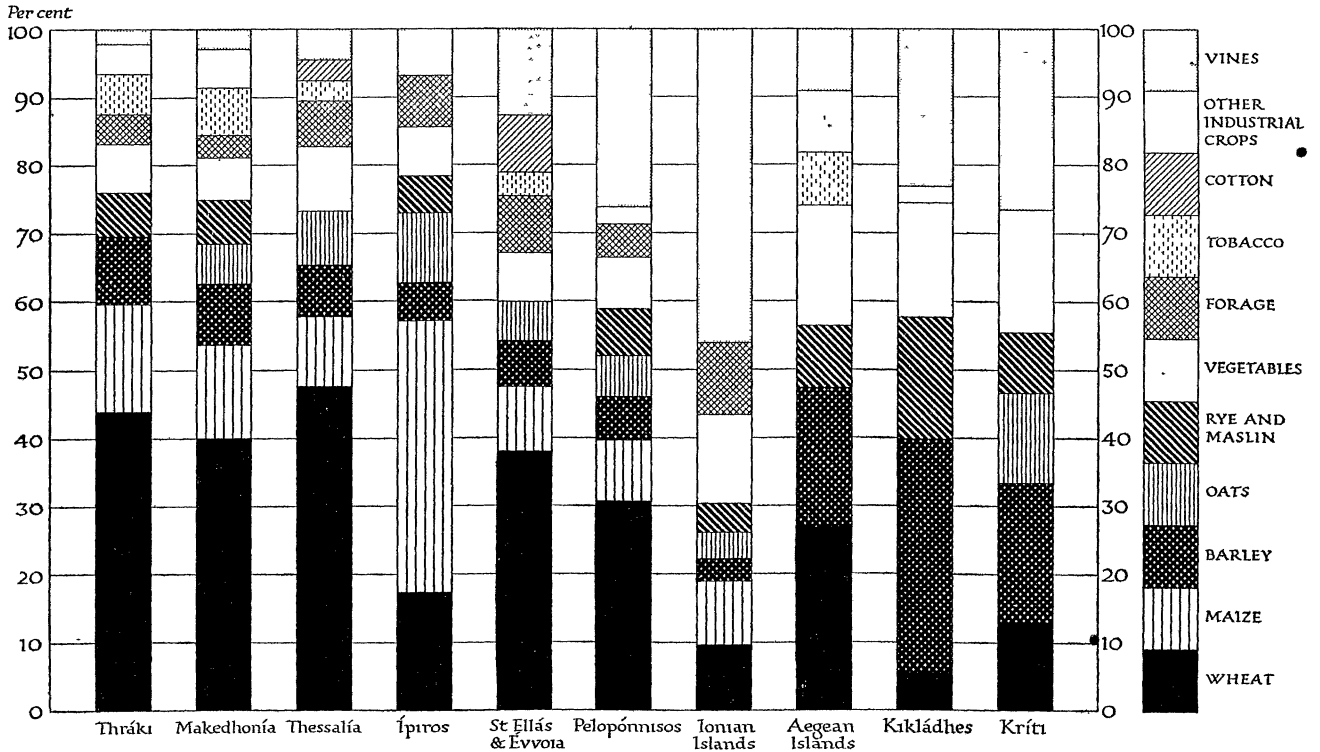

Fig. 16. The percentage of cultivated land in each *dhiamérisma* under various crops
Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp 4–13 (Athènes, 1938).

and by other improvements the wheat harvest was brought in 1938 up to nearly a million m tons. Much hard wheat, unsuitable for bread-making, has been replaced by the Manitoba type, and regular yields have given the farmers an unwonted security. But these benefits are largely restricted to the north-eastern regions, from which comes more than half the wheat crop; even so, the yields of the south are improving through the selective breeding. The results of these improvements, aided by legislation, may be seen from the following figures for the years 1934–8:

Increasing yields of wheat, 1934–8

Year	Area under wheat (1,000 acres)	Total yield (m tons)	Average yield (cwts per acre)
1934	1,956	698,868	7 0
1935	2,092	739,727	6 9
1936*	2,065	531,708	5 1
1937	2,116	817,825	7·5
1938 (hard)	1,106	520,274	9 6
1938 (soft)	1,023	426,250	8 5

Source *Statistique annuelle agricole et d'élevage de la Grèce*, 1938, p 78 (Athènes, 1939).

* A very bad year for all cereals but oats and millet

The geographical distribution of wheat is clearly shown in Figs. 16 and 17. The most important regions, where over 40% of the cultivated land is under wheat, are on the plains of Thessalía, Makedhonía and Dhitikí Thráki. The influence of climate is strongly marked; on the wetter plains of western Greece and in the Ionian islands wheat is considerably less valuable than fruit and maize; in the drier south, as for example in Kríti, it gives way to barley.

Barley

The addition of new territory and the reclamation schemes of northern Greece have not materially increased the acreage under barley, partly because government policy has been to encourage the growth of wheat at its expense, and partly because it is tolerant of the hot and dry conditions of south-eastern Greece. It is therefore grown more commonly in Kríti, the Kikládhes, and the Aegean islands (Figs. 16 and 17), where it still forms the main cereal. In the Pelopónnisos it is only found in the drier eastern regions; while in north-eastern Greece, barley in the form of unripe ears and of

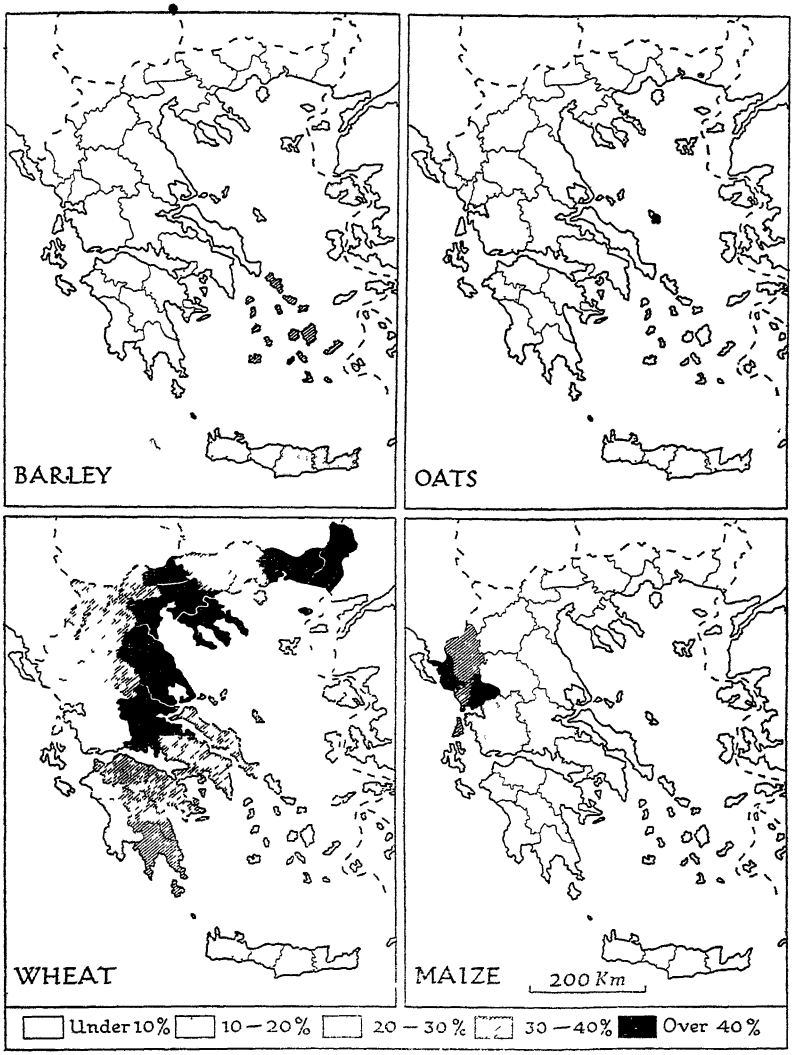

Fig. 17. The distribution of barley, oats, wheat and maize in 1937

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp. 14–51 (Athènes, 1938)

The proportion of land under each crop is given as a percentage of the total cultivated land in each *nomós*

ripened grain is used almost entirely as fodder, especially for horses. The barley everywhere is one or other of the many sub-tropical varieties, which differ considerably from those grown in northern

countries. For the decade to 1940 the acreage was just over 500,000 acres, producing almost 200,000 m. tons of grain per annum.

Maize

Maize needs more water during its growing season than any other cereal, and is therefore grown on land which is irrigated, or which, by nature, stores water close to the surface. Thus it is the chief grain food of rainy Ípiros (Figs. 16 and 17), where it covers more than half the farmland of the recently irrigated *nomós* of Árta; and in all the hill-country of the rest of northern Greece it is mixed with wheat for bread-making. Maize and wheat are equally important in the Ionian islands, and it is also grown frequently in the uplands and irrigated areas of Makedhonía. The growing of maize has steadily increased from 1923, and in 1938 the area came to 690,000 acres, producing well over 300,000 m. tons: it therefore ranks next to wheat as a cereal, but barley remains the most important food in the dry and sunny islands of the Aegean where maize virtually disappears.

Oats

By northern standards oats are poor in Greece, which lies just within the southern limit of this crop. It is important, however, as a tolerant crop of the poor lands, and a little is grown in most parts of the country, though not in the eastern islands. Next to maize it is the most valuable cereal in the wet upland valleys of Ioánnina in north-western Ípiros, and it bulks largely on the less fertile soils of Kríti (Figs. 16 and 17). Its primary use is as a fodder crop for mules: horses usually get barley. The area under cultivation has remained fairly constant, during the last decade amounting to some 350,000 acres: the yield, on the other hand, shows large fluctuations, in a good year coming to over 130,000 m. tons.

Rye

Rye is the characteristic crop of the poor lands and is the principal food of mountain villages in northern Makedhonía and Dhitikí Thráki. Elsewhere it is a constituent of maslin (a mixture of rye and wheat) and is grown on a small scale throughout Greece. Rye and maslin together occupy some 300,000 acres and yield 120,000 m. tons of grain.

Fodder Crops

Fodder crops other than barley and oats occupy very little area, for only a small proportion of domestic animals are fed in this way. In the countries of north-western Europe, where rainfall is plentiful, such crops are grown easily, but in Greece they usually need irrigation. The main field-crops raised as forage are leguminous plants of various kinds, of which the chief is clover: there is also a tree-fruit, the carob or locust-bean (see p. 72). The figures for 1934–38 show a steady rise in the production of fodder crops, and for 1938 are as follows:

Production and value of fodder crops, 1938

Crop	Area (acres)	Production (m tons)	Value (drachmae)
Cereals and leguminous plants for hay	136,283	158,185	246,308,640
Clover	36,509	103,394	169,439,327
Meadow grass (hay)	155,634	173,658	229,551,995
Total	328,426	435,237	645,299,962

Source *Statistique annuelle agricole et d'élevage de la Grèce*, 1938, p. 3 (Athènes, 1939).

This does not take into account the fodder value of the stubble and straw of cereal crops. The distribution in 1938 by geographical regions is shown in the following table, where the dominance of the wetter and cooler Ionian islands is clearly marked:

Distribution of fodder crops, 1938

Province	Percentage of cultivated land	Area (acres)	Production (m tons)	Value (million drachmae)
Dh Thráki	5 07	23,500	29,100	50
Makedhonía	3 74	65,700	95,500	183
Thessalía	6 49	50,200	55,700	96
Ípiros	6 41	16,600	18,400	31
Central Greece and Évvoia	9 54	99,800	140,200	274
Pelopónnisos	5 03	54,600	68,400	137
Ionian Is	11 34	10,100	16,600	26
Aegean Is	2 11	3,000	3,000	4
Kikládhes	0 54	420	1,300	1 2
Kríti	1 85	4,900	7,200	11

Source *Statistique annuelle agricole et d'élevage de la Grèce*, 1938, pp 4–13 (Athènes, 1939).

Other Food Crops

Food crops other than cereals and tree-fruits fall into two classes: those grown, like the small grains, by dry cultivation, largely beans of various kinds and lentils; and those needing irrigation. But in most of the irrigated gardens (*perivólia*) the general practice is to combine food crops with fruit-trees (Plate 21). In many such gardens the bulk of Greece's vegetables is grown. Onions and garlic have pride of place, then cucumbers, marrows and gherkins; and there is much variety of green stuff. Moreover, country folk, and the poorer people in towns, use many wild herbs for salads and cooking. The total cultivated area devoted to pulses and other vegetables has been more than doubled in the last decade, and in 1938 came to some 500,000 acres with produce valued at 2,000 million drachmae.

Tobacco

Tobacco has been grown throughout the Near East since the sixteenth century, but this 'Turkish' or 'oriental' tobacco was not widely used until the paper-wrapped cigarette came into being early in the nineteenth century; nor did the great expansion of cultivation and trade begin until the Crimean War had introduced the Turkish cigarette to Britain and France. This tobacco, in its many varieties, owes its special qualities mainly to the dry summer of the Mediterranean climate and to the long process of selection which this has imposed: soil and skill account for minor variations which much affect the price of the leaf. The tobacco plant in its native home in the central parts of the Americas gets abundant rain and great warmth, and so it puts forth fleshy leaves and grows to the height of a man. Introduced from America into the Turkish empire, it decreased in height to some 30 in. or even 20 in., and produced thin, delicate leaves which possessed a distinctive aroma. So the yield of the Greek crop, though valuable, is of small weight in proportion to the area planted when compared with those of other countries, and particularly with those of countries which have wetter summers, and even with that of Turkey itself. Thus in 1930 the yield of cwts per acre was in Greece 5·4, in Turkey 6·0, Spain 13 2, France 15·4, Germany 18·0 In 1936, a very good year, the Greek yield was 5·8 cwts per acre, and the harvest amounted to some 81,000 m. tons, with which may be compared Bulgaria's 42,200 m. tons and Turkey's 74,100. The average crop in Greece for the period 1926–30 (the most productive quinquennium since 1914) was 63,638 m. tons, and the exported leaf

averaged 51,321 m. tons, valued at about 3,500 million drachmae, over one half the exports of Greece. More recent figures, down to 1939, show an average annual production of about 60,000 m. tons. Two-thirds of the tobacco, and the finest leaf, come from Makedhonía and Dhitikí Thráki (Fig. 16), where it is picked from July to September. Its value depends greatly on the type of land which bears it; and tobacco is graded broadly as coming respectively from the plains, from the hills and, the most valuable, from the terrace-lands found between these two (Plates 22, 23).

Tobacco has claimed much attention from the government in the last two decades. The fine quality of the exported leaf had to be maintained, and so it was necessary to restrain refugees from growing tobacco in unsuitable places. Where the ground is unduly wet, for instance, it will not grow tobacco of the best qualities, and produces a dark leaf. The growing, preparation and marketing of tobacco is under the general control of the Association of Offices for the Protection of Greek Tobacco, which has its centres at Vólos, Thessaloníki and Kaválla. Its research institute at Dráma was founded in 1927; and it has experimental stations in all the important tobacco-growing districts. These are shown on Fig. 18.

Cotton

From the national point of view, cotton is the most important industrial crop, since Greece has been striving for some years past to build up her textile industries. This aim has been largely successful (see p. 121). The crop of cotton, although amounting to less than three-thousandths of the world's production—it came to 16,000 tons of ginned cotton in 1938—has nevertheless met most of the country's industrial needs. The cotton-bush must have no frost throughout its growing period, which covers five months in the south of Greece, and six months in the north: during this period it must have abundant water, whether from rainfall or irrigation. The mean temperature of the hottest month should be about 80° F. (27° C.), but if water is plentiful enough, no summer heat can be too great. Between the opening of the cotton bolls and the picking there should be no rain; the harvest, with from three to five pickings, lasts from August to November.

These climatic conditions are met with generally throughout Greece, except in Ípiros: but in Makedhonía and Dhitikí Thráki there is some risk of damage to the fibre through rain in October. These two regions used to be the chief sources of cotton under

Turkish rule, and a profitable overland export trade from Sérrai persisted until it encountered American competition in Central European markets. In Dhitikí Thráki little cotton is now grown, but Makedhonía is second in production only to Central Greece. The variety grown there is called 'Sérrai', and is believed to be native: it is like Indian cotton, but its leaves, flowers and bolls are smaller, and it has more branches. In the rest of Greece modern growers

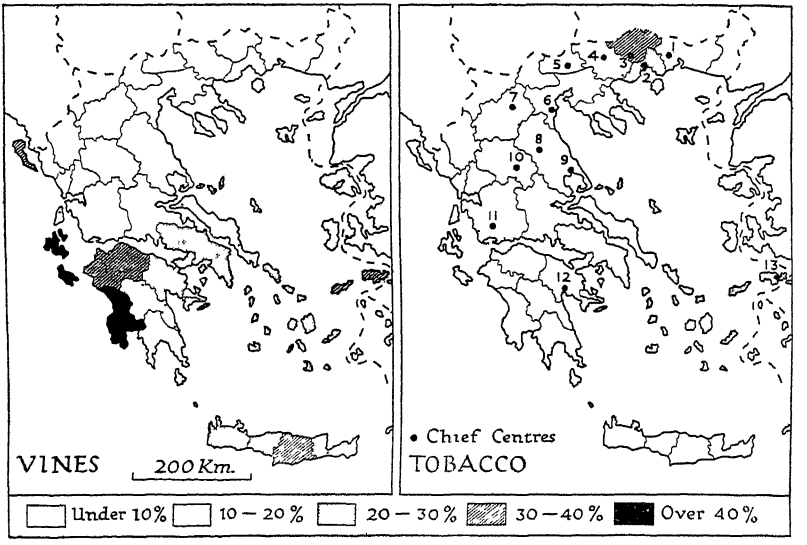

Fig. 18. The distribution of vines and tobacco in 1937

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp 14–51 (Athènes, 1938)
The proportion of land under each crop is given as a percentage of the total cultivated land in each *nomós*. The chief tobacco-growing centres are (1) Xánthi, (2) Kaválla, (3) Dráma, (4) Sérrai, (5) Kilkís, (6) Kateríni, (7) Kozáni, (8) Lárisa, (9) Vólos, (10) Kardhítsa, (11) Agrínion, (12) Árgos, (13) Vathí, Sámos

have concentrated their efforts on producing the long-stapled silky variety, 'Akala III', which has been brought in from the United States. This accounts for 55% of the total production: it fetches better prices than any cotton except that of Egypt. It is grown in the Kopaís and Lamía districts of Central Greece, giving that region the lead in production; in the lower parts of the plains of Argolís, Lakonía and Messinía; on the western and eastern plains of Thessalía, and round Mesolóngion in Akarnanía and Íria in Argolís. The introduction of this variety has reversed the character of the Greek cotton trade: whereas formerly fine cotton was imported and

mixed with native fibre of poor grade, now Indian and similar cotton is brought in and added to the superior Greek cotton, and goods are thus produced suited to the markets of the Balkan Peninsula. The seeds from the ginneries are a valuable by-product, giving oil and cake for feeding animals.

Sesame

Sesame, one of the richest industrial plants, is an annual herb, widely grown for the sake of its seed, which will yield up to 60% of its weight in oil. It is a summer crop of the plains, and so, like maize, must have ground water or irrigation. The seed is gathered in August or September, and some of it is used as food; but the chief aim is oil, which is extracted and serves many purposes. It may be used as a substitute for olive-oil, though its use as an adulterant of this is forbidden. The crushed residue, like that of cotton-seed, gives a nourishing cattle fodder.

The Mulberry

The mulberry acquired its great importance with the introduction of the silk-worm into Europe. Silk was known to the Greeks and Romans, and Aristotle knew that the silk-worm produced it; but it was not until the sixth century A.D. that the Chinese secret was smuggled into Europe. The silk-worm's host, the mulberry-tree, long at home in Greece, was then planted throughout the country wherever it would grow; and the Pelopónnisos was so much planted with it that it became known as 'the Morea', from the Greek name of the tree, *moréa*. But the ancient tree was the black mulberry, *Morus nigra*: the white-berried kind, *M. alba*, was introduced into Europe only in the twelfth century, and has since then been the variety mainly used for silk-worm culture. In Greece, the Turks systematically destroyed the trees during the War of Independence; and where Turkish arms did not reach, disease almost wholly exterminated the silk-worms. But when Krítı, Makedhonía and Dhitikí Thráki were added to the Greek Kingdom, the industry was revived, and has since been developed, chiefly in the northern provinces; it has, however, suffered from the fluctuations of the market caused by economic conditions.

The mulberry is a broad-leaved deciduous tree, and, being grown mainly for the sake of its leaves, its roots must be well watered. Hence in Greece it is found along the banks of streams and on alluvial plains, where in summer its roots reach ground-water

(Plate 23). It is always well pollarded, so as to make the picking of the leaves easy. The annual production of leaves may reach some 80,000 tons, while that of fruit averages about 2,400. In the silk-producing area the fruit is a minor consideration, but in Ípiros and the Ionian islands the mulberry is grown for its fruit. The striking development of the silk industry in Greece is described on p. 124: whereas in 1924 only one-tenth of the cocoons (which in that year totalled some 2,600 tons) was used locally, and the rest exported, by 1932 the Greek industry was absorbing the whole output, and was importing cocoons as well. In 1935–38 the annual Greek output of cocoons averaged 3,482 tons; in 1938 it came to 3,842, of which 2,465 were from Makedhonía and Dhitikí Thráki, 453 from Thessalía, and 403 from the Pelopónnisos. The yield of raw silk from these cocoons was about 270 m. tons, mainly sold in Greece: but a ton was exported, together with 81 m. tons of 'knubs' (silk waste), used in the manufacture of the less fine fabrics.

This growing industry, and the production of the raw silk for it, has been encouraged: for instance, an Institute of Silk Culture has been set up, and improved machinery has been installed in the factories. If the industry should maintain its progress, and the production of raw silk in Europe become more profitable, the plains of Makedhonía and Thessalía, with their newly-cut canals, might well find the mulberry as prominent a feature as it has long been of the Paduan Plain in Italy.

Fruit Growing

The Olive

The olive, the most important fruit-bearing tree of Greece, has been cultivated there since time immemorial: it was said to have been the gift of Athena, to whom it was sacred. It served the ancient Greeks for many purposes, providing food, light and unguent. Its destruction in war was very grievous, for an olive-tree takes quite seven years after planting to produce a profitable crop. Greece is the third olive-oil producing country in the world, surpassed only by Spain and Italy. The portion of her cultivated land devoted to olives has been put at one-seventh, supporting perhaps more than sixty million trees: and there are at least as many wild olive-trees growing among the *maquis*, or, in places, in natural olive-woods, which have been grafted, or might be grafted, in order to add to the output of fruit. The olive-grove's grey-green foliage is one of the most characteristic features of the scenery at the lower altitudes of

the whole Greek peninsula and of many of the islands, but the tree will not stand long frost, and therefore will not grow in the mountains, or in Makedhonía and Dhitikí Thráki, except on the coast and in a few favourable inland places (Fig. 19). It is not clear what climatic conditions determine the height at which it will live: in the Pelopónnisos its upper limit is about 2,250 ft. in the west, and

Fig 19 Olives in Greece

The left-hand map is based on a map by P. T. Anagnostopoulos (Athens, 1931); the right-hand map is based on data from *Statistique annuelle agricole et d'elevage de la Grèce*, 1938, pp 100–75 (Athènes, 1939).
Olives are most widely grown in lowlands and in southerly districts where there is least danger from sustained frost The size of the circles indicates the value of olives and olive-oil production in million drachmae for each *nomós* in 1937, this was a very good year for olive production.

2,000 ft. in the east; in Khalkidhikí some 1,500 ft., but on the south-west slope of Ólimbos, in Thessalía, about 3,250 ft. It is not particular about soil, but prefers lime. A native of the *maquis*, it resists the summer drought. Olive-groves are found in situations of all kinds, from steep but terraced hill-sides to flat plains where vines or annual crops are often grown beneath the trees. They are most widespread in the stony lands of eastern Central Greece (Plate 25).

When properly tended, the olive remains productive for a very long time: it needs great skill in pruning, and destructive pests have to be carefully watched for. During the war of 1914–18 and afterwards, there was much ruthless pruning; and so, in 1922 and again in 1933, the government exercised measures of control Damage

from pests, particularly the *Dacus* fly, was countered by supplying the means and special labour for spraying the trees. Furthermore, the government is interested in keeping up the purity of olive-oil, and has forbidden its adulteration with other vegetable oils. In the groves, the soil is usually cultivated in October, and again in spring and summer. In round figures, 600,000 tons of olives are harvested yearly for their oil, of which 100,000 tons are extracted: after pressing, residual oils, chiefly used in soap-making, are extracted chemically from the husks (see p. 128). Greece suffers from a shortage of refineries suitable for producing oil of the best qualities; in 1934 such existed in the districts of Mitilíni, Kérkira, Kalámai, Lakonía, Khíos and Ikaría. Elsewhere, the olives suffered from the delay which occurred between their gathering and treatment. Of table olives the annual yield is about 30,000 tons. They form a considerable local item of trade, for about half of them are exported. The chief centres of production are Vólos, Ámfissa, Árta, Stilís and Agrínion. The ripe black olives are salted and play a large part in the native diet, and the olive is undoubtedly the most important fruit-tree of Greece.

Vine Cultivation

In Greece the tending of vineyards, as of olive-groves, is a heritage of remote antiquity and tradition, and the care of the grape vine, perhaps more than any other task, gives the Greek peasant his character of gardener rather than ploughman, particularly in the coastal lands and the islands. One result of this training is seen in the success of very many emigrants to the United States who find employment there as gardeners, florists, fruit farmers and market-gardeners. In Greece nearly all the vineyards are worked by the small farmers who own them, and their families; and in spite of many difficulties of marketing, it is a profitable occupation. Viticulture is, moreover, intensive, in that it occupies from 160 to 200 working days in the year of a typical grower; and so it is well suited to a country of small holdings and large numbers of workers.

The vineyards of Greece are of great economic value: during the period 1928–37, the vine covered 10·96% of the cultivated area; produced in value 16·54% of the whole agricultural output; and contributed 25% to the total value of exports, and 28% to that of exported agricultural products. The distribution of vineyards is shown in Fig. 18; the density is greatest in the Ionian islands, the western Pelopónnisos, and then in Argolís, Attikí-Voiotía and

Évvoia, and in Kríti. The area cultivated in each geographical province in 1937 is given in the following table:

Distribution of vineyards, 1937

Region	Cultivated area (acres)	Percentage of cultivated land
Ionian Islands	42,862	45·8
Pelopónnisos	271,374	26 1
Kríti	67,236	26·0
Kikládhes	16,815	22·9
Central Greece and Évvoia	126,892	12 4
Aegean Islands	13,650	9 1
Ípiros	16,522	6 3
Thessalía	35,307	4 2
Makedhonía	54,101	3 0
Dh. Thráki	9,471	2·2
Total	654,230	10 96

Source *Annuaire statistique de la Grèce*, 1938, p 112 (Athènes, 1939)

The grapes are devoted to three purposes, for wine-making, for drying, and for table use. The annual figures on which the following table is based show that there were considerable fluctuations from year to year: these were due to the weather, to pests and to economic causes. They leave no doubt of the relative importance of dried grapes, and especially of currants, which distinguishes Greek viticulture.

Average annual production of grapes, 1928–37

Products	Production (m tons)	Percentage value of harvest (2,313 (million dr)	Percentage value of exports (1,552 million dr.)
Dried Grapes	173,900 { Currants 148,000; Sultanas 20,900; Raisins 5,000 }	56	77 95 { Currants 60 42; Sultanas and Raisins 17·53 }
Must	31,000	37	19 74 { Wines; Brandies; Must }
Table Grapes	52,000	7	2 31

Sources (i) *Statistique annuelle agricole et d'élevage de la Grèce*, 1932 *and* 1937, p 53 (Athènes, annually), (ii) *Annuaire statistique de la Grèce*, 1938, p. 114 (Athènes, 1939)

In 1937 grapes for wine production covered 60% of the vine area, those for currants 24%, for raisins 5%, for table grapes 8%, and the remainder of the area was planted with new or unproductive vineyards. In the Pelopónnisos more than half the area was under grapes for drying (Plates 7, 26, 27).

Diseases and pests attack the vines, as in other countries. Since 1898 *Phylloxera* has affected the north-eastern regions, including all Makedhonía, northern Thessalía, and the Aegean islands; but stringent action regenerated the vineyards in these parts, and kept the trouble out of Old Greece. The vines of Makedhonía again required renewal after the war of 1914–18.

Grape-vines in Greece are grown as bushes, with no artificial support: the lowest and longest branches are just above the ground. In 1938 a very few vines were being grown on arbours after the fashion of other countries. The currant vine is slightly different from others: it has a straight stem, one or two feet high, below the first branches. The vineyards are usually not, as in more northerly countries, on steep slopes, but on flat or undulating ground, preferably with deep and fertile soil. At the lower altitudes many vines are planted under olive-trees, but in the hills vineyards are treeless: they are found at heights up to about 4,000 ft. in the Pelopónnisos.

Wines. Uniform though the vines are in appearance, their grapes are of the greatest variety. so too are their wines, which range from a white, dry type, like those of Central Europe, to strong southern wines, good for mixing. There are sweet wines, such as the famous white of Sámos, the red from Kérkira and Pátrai, and, from western Makedhonía, Siátista's amber vintage. About one-third of the Greek vintage is dealt with by admirably furnished co-operative centres such as those of Attikí, Khalkís, and Sámos, but much Greek wine is made by the growers themselves in a primitive manner, and contains but 10°–11° of alcohol: nor does it keep well; and so resin (mostly from the Aleppo pine) is added, to form a preservative film on the surface and extend its life This makes it displeasing at first to the palates of most foreigners, but the discerning can distinguish, as do the Greeks, the abiding merits of the local wines so treated.

The yearly drinking of wine in Greece is thought to come to about 44 pints for each person in Spain it is 118, in Italy 166, and in France 275 pints. It is, no doubt, much greater than 44 pints in the south of Greece, and it will clearly increase in the north as the people

there become more prosperous. Moreover, wine-making will certainly grow into a more profitable industry as the types of wine and the processes of manufacture are standardized.

Dried Grapes. The two chief kinds of grapes which are used for currants and sultanas respectively are small, seedless and thin-skinned. The currant grape, which gets its name from Corinth, is probably a product of cultivation, and has been grown in the north-western part of the Pelopónnisos since the Middle Ages at the latest. It needs a hot rainless summer; and since it is almost restricted to the western side of Greece, it seems that there the alliance of a greater winter rainfall and dampness of soil with a higher humidity suits the plant. Currant vineyards thus extend from Levkás and Aitolía southwards to Messinía, where the fruit is poorer in quality, and along the southern coast of the Gulf of Kórinthos, where it is at its best: the main market is at Pátrai. In the Pelopónnisos currant vines do not generally grow at heights above 1,100 ft., and the vineyards commonly follow the valleys inland up to this height. After the War of Independence they had to be re-established, and their area rose from 9,400 acres in 1830 to 141,200 in 1870, and to its maximum, 165,000 acres in 1891, when, after the destruction of French vineyards by *Phylloxera*, currants were in great demand for wine. Since then, over-production and Australian competition have caused serious crises: but from 1925 a public body called the Central Currants Office, after reducing the area somewhat, has been able to balance supply and demand. From 1933 to 1937 the area put under currants was on an average 160,000 acres, with a crop of 130,600 tons. This was 88% of the world's crop; nearly all the rest came from Australia About half of the Greek crop, by weight and by value, was exported, and Britain, which buys the best of the fruit, took some two-thirds of this. Of the currants consumed in Greece, all but 4% are used industrially, in the main for making alcohol and vinegar.

The sultana grape is grown mainly in the Pelopónnisos and Kritί; and all the raisin grapes (*rozákia*) come from Kríti, half of whose vine area is devoted to grapes for drying. The output increased steadily in recent years, and from 1935 to 1937 came to 7%, on an average, of the world's production. The sultanas and raisins, unlike the currants, are almost entirely exported. Germany and Britain have been the chief customers, and the excellent quality of the crops (Greek sultanas fetched the highest prices in London) has ensured a ready market in spite of the competition of countries with a

larger production, notable the U.S.A. (California), Australia and Turkey.

Table Grapes. The growing of table grapes is largely an innovation: area, output and value were all more than doubled in the decade 1928–37. One great advantage lies in the variety of types grown, which gives a long season for marketing. July's grapes from Kríti are followed in August by other sorts from Kórinthos, and these by more from Kríti, and again by others from Pátrai and Évvoia, lasting until December. The further expansion of this valuable product is clearly a matter only of organization, transport facilities and care: in 1937 the chief buyers were Egypt, Britain and Poland, but just before the war of 1939 the export of fresh grapes, as of certain other fruits, to Central Europe was much increased.

Figs

Like olives, figs (*Ficus carica* and other kinds) are grown on somewhat stony ground, or at least without irrigation; they are planted also on the fringes of watered land. They occur in all the provinces of Greece, but nearly four-fifths come from the Pelopónnisos, and three-quarters from Messinía alone. The first crop, borne in June and July, is mostly eaten fresh; and it is the second, and sweeter, crop gathered from August to October which is preferred for drying. In 1936–39 the yield averaged 50,000 tons, and most of this was dried, and quite three-quarters of it exported The methods of harvesting, drying and packing the figs have since 1929 been standardized by the 'Office for the Protection of Greek Figs', which pays great attention to hygiene, and notably to the sterilization of the fruit in leaden vacuum-chambers.

Carobs

Carobs or locust-bean trees (*Ceratonia siliqua*) also grow on rather stony ground and again without irrigation. They are mostly found on waste land, and nine-tenths of them are in Kríti, where the climatic conditions are hot and dry; none occurs in northern Greece. The crop, used mainly as fodder, comes to some 20,000–30,000 m. tons a year, over half of which is exported.

Citrus Fruits

These are of great, and growing, importance. Disliking frost, they are found only at low altitudes near the coast, and hardly at all in

Makedhonía and Dhitikí Thráki; in Attikí they often suffer from frost, and in the Pelopónnisos they do not grow at heights of more than some 1,150 ft. Moreover, they need abundant water, and this restricts them largely to irrigated areas. Their distribution is illustrated in the following table, showing the production in terms of the number of fruits:

Fruit production in 1937

Region	Oranges '000	Mandarins '000	Lemons '000	Citrons '000	Other Citrus Fruits	Percentage of total production
Pelopónnisos	71,755	26,489	52,421	340	2,300	30·0
Aegean Islands	45,690	73,270	7,251	4	1,121	25 5
Krfti	32,223	33,242	6,098	3,672	1,426	15 6
Central Greece and Évvoia	5,527	7,289	34,572	15	434	9 4
Ípiros	35,012	1,376	6,379	23	670	8 6
Ionian Islands	17,566	1,533	10,508	8	122	5 9
Kikládhes	1,581	1,962	8,773	172	116	2 5
Thessalía	9,546	1,006	822	15	725	2 45
Makedhonía	50	9	169	—	4	0·05
Dh Thráki	12	—	—	—	—	
Total	218,962	146,176	126,993	4,249	6,918	100

Source *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp 178–9 (Athènes, 1938).

Production varies a good deal from year to year and from district to district, but probably averages in weight some 40,000 m. tons. Thousands of new trees have been planted in recent years, and oranges and mandarins have been largely exported to Central Europe: locally, the manufacture of squashes and essential oils has been fostered

Neither oranges nor lemons were known to the ancient Greeks: both were brought into Africa and Europe from Asia by the Arabs, and it is significant that the Greek word for oranges is *portokállia*, 'Portuguese fruits', and that our 'lemon' and the corresponding Greek *lemóni* are words of Arabic origin. These fruits do well in soil containing lime, but it must be both moist and well drained, and watering is necessary in dry weather. The trees demand much pruning and manuring: with care, they will bear for many years. The lemon is more delicate than the orange, but both are injured by cold. They are liable to be attacked by a fungoid disease, against

which grafting, by renewing their vitality, is a protection. Another enemy is the insect *Chermes hesperidum*. The fruit is gathered in the winter months. Both sweet and bitter (Seville) oranges are grown; and mandarins (tangerines) are specially favoured in the Aegean islands and in Kríti. The citron (French *cédrat*: confusion arises since *citron* in French means 'lemon') is grown mainly in Kríti, though not extensively even there.

Other Fruit Trees

The almond and the walnut must be specially mentioned. Some 7,000 m tons of almonds, and some 6,000 m. tons of walnuts are grown annually. Both trees flourish in all regions, but the walnut, a typical central European tree, grows at higher altitudes everywhere than the almond, which is less hardy, and is grown most successfully in Kríti. None of the other tree-fruits compares in importance with those already described: plums, peaches, apricots, cherries, quinces, apples, pears and pomegranates are all grown, but mainly for local use. In the true Mediterranean climate they mostly need some irrigation, so that their range is restricted

Livestock

The settlement of refugees throughout Greece vastly changed the aspect of the uplands, for every group of newcomers set about clearing tracts of bush round their new or restored villages, and the same thing happened more sporadically elsewhere on the mainland. This, as well as the more intensive cultivation of the plains, reduced the pasturage available for flocks of sheep and goats, and thus upset the traditional semi-nomadic system of stock-keeping. Since the changes are predominantly in the lower land it was the winter pasturage that was principally reduced; and it is there that the flocks receive their annual increase of lambs and kids before the migration, in spring or early summer, to the mountains. Thus some change was inevitable; either the stock could be reduced, or a system of more sedentary and more intensive stock-rearing must be established. This could not well be brought about except by hardship for many owners of flocks; and when war broke out in 1940, changes had not become widely effective. The one fact emerging clearly from Greek statistics is that, far from decreasing, livestock in Greece has greatly increased.

Increase in numbers of animals, 1928–37

Animals	Cattle	Buffaloes	Horses	Asses	Mules	Sheep	Goats	Pigs
Number in 1928 (thousands)	910	45	221	342	160	6,920	4,919	419
Number in 1937 (thousands)	998	67	372	411	188	8,451	5,288	465
Percentage increase	9	49	26	20	18	22	8	10

Source *Annuaire statistique de la Grèce*, 1938, pp. 447–50 (Athènes, 1939).

Cattle

In 1937 there were nearly one million cattle in Greece; of these 217,000 were milch cows mostly imported, and kept near the larger towns, where alone hitherto cow's milk has been demanded. The nation's milk supply is insufficient and in recent years some 2,000 tons of condensed milk have been imported annually. It is likely, therefore, that in the future dairy cattle will be increased in number and be more widely distributed. The rest of the present cattle are kept primarily for their work and not for meat or milk; they are of the steppe type, small and varying in colour from red to dark grey. Cattle-breeding has not received much attention in the past.

The general distribution of cattle by regions is shown in Fig. 20, and the relative importance of the three chief forms of stock is represented diagrammatically in Fig. 21. Cattle are few in the southern mainland, especially where the land lies in rugged relief and the lusher herbage is scarce, as in Arkadhía, Argolís and Attikí. They are most numerous in the north-east: this reflects not only the change towards a central European climate, but also the extent of cultivated plains and ploughland; for in general cattle did more farm work than horses on the northern plains.

Buffaloes

A powerful, though slow, draught animal, the buffalo was formerly more widely used upon the plains. To-day it is found chiefly in Dhitikí Thráki and Makedhonía, although it is still bred in Aitolía, where it also runs wild in the swamps. The striking increase in the total number of buffaloes is probably due partly to a demand for the rich milk plentifully given by the cows. Greek buffaloes are black, and the bulls may weigh as much as half a ton.

Horses, Mules and Asses

Compared with cattle, the number of horses shows a marked increase. This no doubt bears witness to a progressive change in the kind of animals used for draught on the farms, particularly on the northern plains. But the majority of the horses would be better described as hill ponies whose work is that of transport, chiefly as pack animals. Most of them are of very mixed breed, and vary in

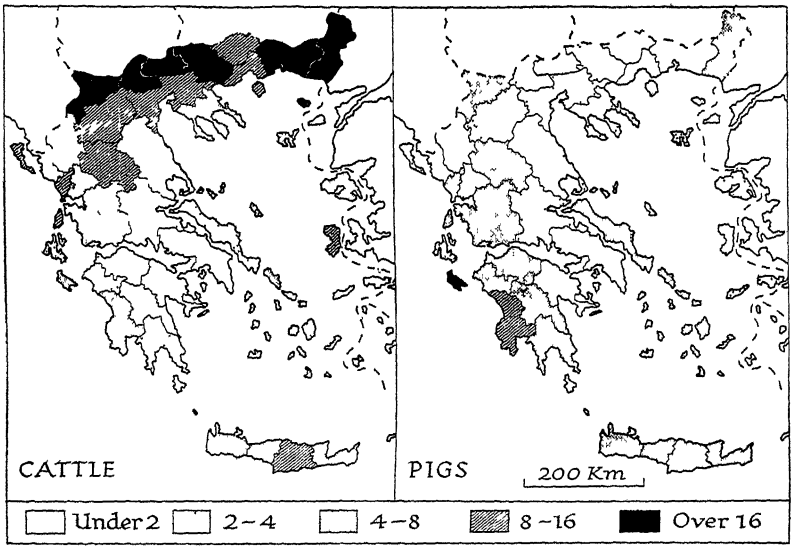

Fig 20. The distribution of cattle and pigs in 1937

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp. 190–1 (Athènes, 1938).
The figures represent the density of cattle and pigs per sq km in each *nomós*.

height between about 11 and 14½ hands. The ponies of the island of Skíros and the small horses of the Píndhos deserve mention as native breeds. The former are strong, active, clever little ponies of some 11 hands: they fend for themselves in the mountainous pastures of the island. The latter are bred by the nomadic shepherds of the Píndhos; their stature can be improved by ample feeding when they are young. The numerous owners of pack horses and mules in Greece fill an important rôle: whether the horse or the mule is the more used in a given district depends somewhat on the relief of the land and the state of the paths; mules are better on the roughest ground. The ubiquitous ass is chiefly used for short journeys,

especially to and from the fields. The islanders mostly make small use of horses, as the following table shows; on the mainland, Thessalía and Dhitikí Thráki depend chiefly on the donkey, while horses predominate in Makedhonía, Ípiros and Central Greece and Évvoia:

Ratios of Horses, Mules and Asses in use

Mainland	Horses	Mules	Asses
Thessalía	4	1	9
Dh Thráki	5	1	9
Makedhonía	4	1	5
Ípiros	3	1	2
Central Greece and Évvoia	6	3	4
Pelopónnisos	7	3	5

Islands	Horses	Mules	Asses
Ionian Is.	7	1	9
Kikládhes	0	1	5
Aegean Is.	1	1	3
Kríti	1	2	7

Source: *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, p. 189 (Athènes, 1938).

The agility and surefootedness of the horses and mules are remarkable; the horse does not deserve its modern name, *to álogon*, 'the unreasoning beast', which was used in classical Greek as a general term for all non-human animals, but has since the Byzantine period been applied to the horse, as the beast *par excellence*. The use of flat iron plates covering the whole hoof, instead of shoes of the usual kind, may be mentioned.

Sheep and Goats (Figs. 21, 22; Plate 20)

Greece has some fourteen million sheep and goats, which form an essential part of the economy of the country: they are the mainstay of large numbers of highlanders, providing three-fifths of the milk supply, the main source of meat, animal fat, wool and hair. The highlanders of north-western Greece depend largely on these flocks and on the practice of 'transhumance', the seasonal migration from one kind of pasture to another: this applies particularly to the north-west, and above all to the Vlachs, but holds good also for every part of the mainland and for the larger islands. The proportion of sheep to goats in the flocks varies from region to region, but sheep are generally in the large majority. The distances travelled between summer and winter pastures differ greatly, and the dates of starting and ending the upward and downward migrations are not altogether uniform; but these important events usually coincide with festivals of the Church; for instance, the Vlachs will not start to go up to

Samarína before St George's Day (6 May N.S.), and will start to go down from there to their winter pastures on St Demetrius's Day (8 November). In general, departure from the lowlands is possible when the lambs and kids, born in December or January, have been weaned, and the flocks thereafter go up as the snows melt and the first herbage of summer permits. Throughout the summer the shepherds are busy with dairying work, shearing, and getting their produce to market; and the descent from the mountains begins after the first snowfalls, which usually come in October. Vast flocks will pass through a large town, such as Thessaloníki, by night, with their bells removed or muffled.

The ewes and goats give their milk mainly when they are on their summer mountain pastures. It is there quickly made into butter and cheese, furnishing over half the butter made in the country and nearly all the cheese (Plate 28). Thus the people of the lowlands are able to utilize the natural meadows among the high ranges when their own country-side is parched. Goats are much better milkers than ewes: a ewe gives about 120 pints of milk a year with as much as 260 pints for the Árgos and Khíos breeds, and 440 for those of Skópelos; goats average 160 pints, but a Maltese goat may give over 900 pints A number of these famous milkers are kept near towns and villages in order to ensure the supply of fresh milk. In the butter from all these flocks, together with mutton suet, the Greeks find their commonest medium for cookery; they use these as much for this purpose as olive oil, which is also taken in salads.

The extent to which the Greeks depend on sheep and goats, rather than cattle, for milk products is noteworthy. Apart from providing three-fifths of the fresh milk, they produced in 1937 over two-thirds of the very small quantity of butter (only some 600 tons) made in the country, and about 97% of the cheese. The hard cheese of the country is of low appetitive value; but the soft 'cottage' type, eaten fresh, is excellent. Another milk product which appears under the heading 'Cheeses' on Greek bills of fare is *yiaoúrti*, a semi-liquid substance, like a creamy junket, eaten with a spoon: it has been introduced into London dairy-shops under its Turkish name *yaghourt*, and also sold as a 'health-food' in England under various names; it is in fact both pleasant and health-giving, but the layer at the bottom of the vessels in which it is made should not be eaten. Greece's total production of cheese in 1937 amounted to some 6,437 tons, of which 5,209 consisted of soft cheese The co-operative cheese factories in Kríti and elsewhere, set up in recent years with

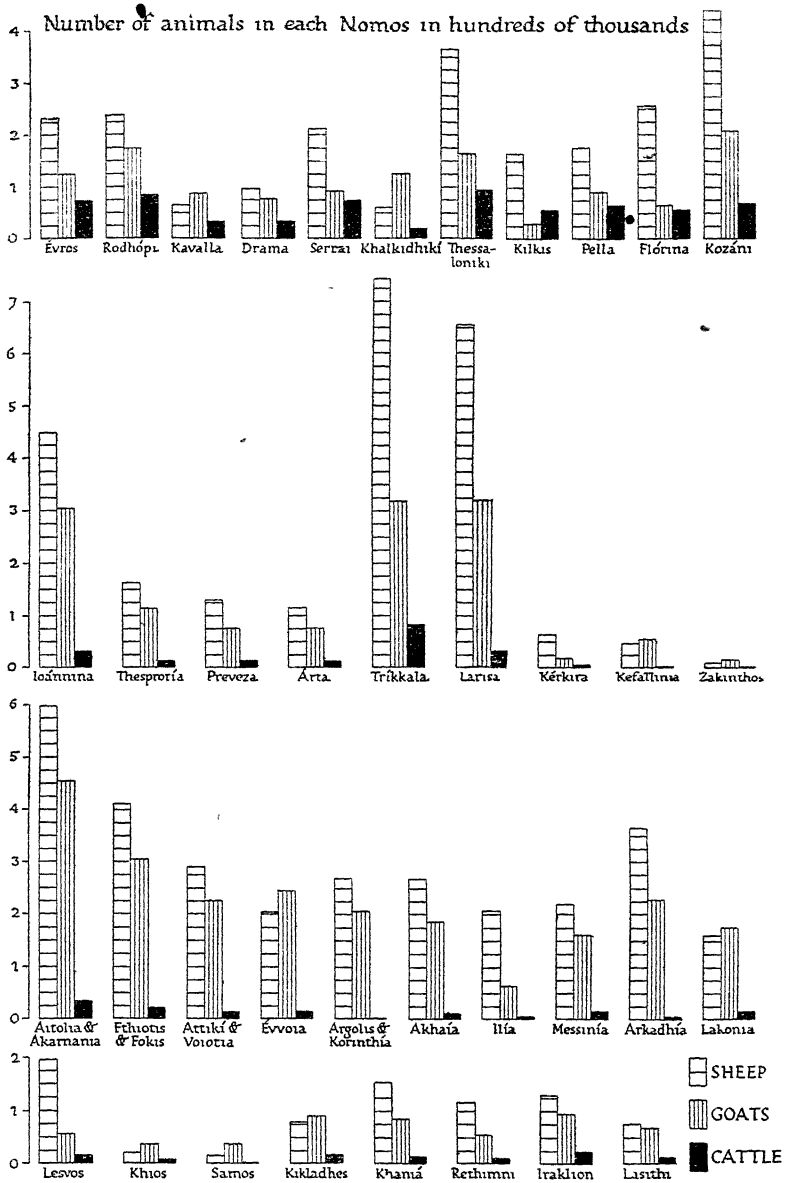

Fig. 21. The number of sheep, goats and cattle in each *nomós* in 1937 (in hundreds of thousands)

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp. 190–1 (Athènes, 1938).
Each rectangle in the column giving the number of sheep represents 25,000.

the assistance of the Agricultural Bank, have produced an excellent cheese of the Gruyère type known locally as *graviéra*.

The rise of 19% in the number of sheep from 1928 to 1937 may seem surprising in view of the loss of winter pastures for cultivation While probably the partial adoption of stationary stock-farming has led to higher birth and survival rates, the increase seems also to bear out the suggestion that the semi-nomadic flock-owners,

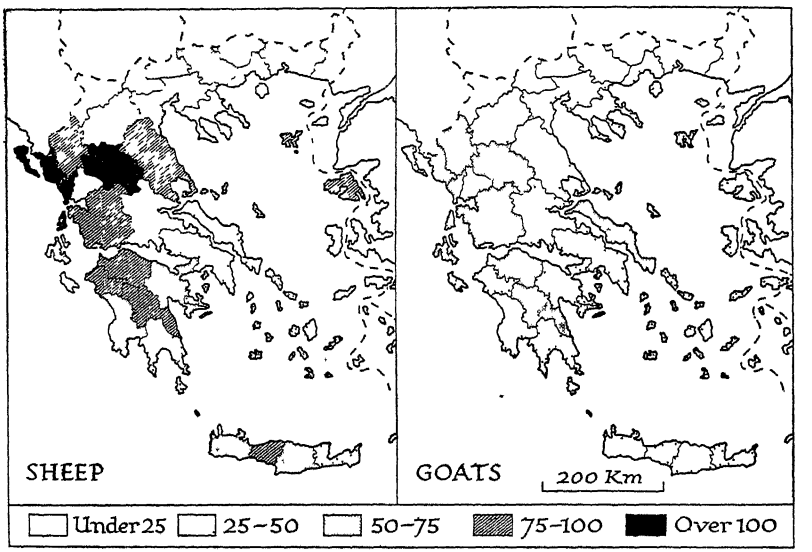

Fig 22 The distribution of sheep and goats in 1937

Based on data from *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp. 190–1 (Athènes, 1938).
The figures represent the density of sheep and goats per sq. km. in each *nomós*.

independent and conservative hill-men, have been slow to accept new conditions, and that much of the increase reflects their determination to maintain their ways. The *mándra* (sheep-fold), with its savage dogs trained as its guardians, seems likely to remain a familiar sight. These dogs, which in the north-east are largely interbred with wolves, are not sheep-dogs in our sense; indeed, the shepherds are incredulous when told of the duties of an English sheep-dog. To them, a dog is a watch-dog.

The voracious goats of Greece are as nearly omnivorous as animals can be and there are only a few poisonous or very prickly plant species that they refuse. In particular, they eat any tree seedlings

and young shoots within reach. A reduction in their numbers is therefore desirable, but would doubtless meet with opposition, especially since they produce so large a proportion of the milk of the country The main purpose of sheep-breeding is to produce milk. This goes far to explain the small quantity of wool produced, insufficient, partly owing to its poor quality, for the national needs (see p. 122). But sheep-breeding for an improved fleece would not be an easy policy to follow so long as milk is the shepherd's primary aim.

Pigs (Fig. 20)

Pigs are not very common in Greece, and there is very little rearing on a large scale; the chief large sties are maintained by the Ministry of Agriculture for scientific purposes. A peasant may keep a sow or two, and the pork helps to feed him and his family: it is sometimes cured and kept in oil for the winter. The Greek pig is a woolly animal of the type found in the northern Balkans.

Poultry and Rabbits

Poultry are kept everywhere, usually on a domestic scale: farms are found near the larger towns, but Greece has to import eggs to supplement the local supply. Rabbits are to some extent kept with the poultry on these farms, and there was a tendency to increase rabbit-keeping in the years just before 1939; but the peasants do not esteem rabbits for their meat, and dislike them for their destructiveness and prolific ways.

Bees

Bees have always played a most important part in the economy of Greece. Honey was almost the only sweetening agent for the vast majority of her people. In ancient times the mysteries of the hive inspired a large practical and imaginative literature, and the honey of Mount Hymettus was especially famed. Hymettus honey is still sold in Athens. The aromatic plants of the mountain slopes, such as the thyme, savory, marjoram and lavender which give the honey of Hymettus (Imittós) its distinctive flavour, provide a splendid natural pasture for the bees.

Hives are of two kinds, the primitive 'skep' variety and the modern or 'European' sort with movable frames. In 1937 the average production of honey for each primitive hive was a little over 11 lb., and for each modern hive about 22½ lb.—by no means a high production. Much higher yields, sometimes up to 35 lb., are not

uncommon. The primitive hives outnumber the others by more than 10 to 1, and the distribution of the latter is very uneven, ranging from Dhitiki Thráki with a proportion of nearly one modern hive to two skeps, to Kríti with a ratio of 1 : 70. The use of modern hives and methods of bee-keeping greatly increases the yield of honey and wax, as the following table shows:

Distribution of hives and production of honey and wax by regions in 1937

Region	Number of Hives		Honey produced (m tons)	Approximate ratio of		Wax produced (m tons)
	(*a*) Primitive	(*b*) Modern		(*a*) to (*b*)	Honey from (*a*) to Honey from (*b*)	
Makedhonía	141,637	20,562	1,214	7 . 1	4 : 1	80
Central Greece and Évvoia	138,477	13,013	1,002	10 . 1	5 · 1	77
Pelopónnisos	123,807	6,787	631	20 1	8 · 1	70
Kríti	78,623	1,555	268	70 . 1	23 1	30
Thessalía	46,128	910	216	50 1	21 . 1	26
Ípiros	34,359	2,888	138	12 · 1	8 1	14
Aegean Islands	22,591	1,650	124	13 1	7 1	16
Dh Thráki	14,252	6,633	104	2 1	1½ 1	6
Kikládhes	15,862	479	57	30 1	21 · 1	8
Ionian Islands	12,939	4,527	52	3 1	1 · 1	5
Total	628,675	58,604	3,806	10 1	5 1	332

Source *Statistique annuelle agricole et d'élevage de la Grèce*, 1937, pp 193–219 *passim* (Athènes, 1938).

Forestry

From 600 feet to the greatest heights in Greece forest and scrub cover the larger part of the surface. Woods are relatively more open in Mediterranean lands than in Central Europe and therefore the undergrowth is richer. At all heights much land once forested is now bare, but three forest types are clearly differentiated, the Mediterranean evergreen, the mixed deciduous, and the coniferous. The distribution and nature of these types are discussed in vol. 1, pp. 113–20 of this Handbook.

The total area of Greek woodland is estimated to be just over 5 million acres, representing 14% of the surface of the country. similar figures for Great Britain are some 3 million acres and 5·4%

respectively. The Greek figures are probably a considerable overestimate, unless many kinds of brushwood and exceedingly open woods are included. Publicly owned 'forests' occupy about three-quarters of the total area as shown in the table on p. 84.

Ownership varies greatly in different parts of the country. Thus, in the island of Lévkas all the forests (4,500 acres) belong to the state, while in Zákinthos they are exclusively private property. At least up to quite recent times, the private forests have, on the whole, received the best treatment and the communal and ecclesiastical (mainly monastic) forests the worst.

Forest Administration

Forest administration in Greece has been considerably handicapped since its inception in 1836 by the lack of sufficient trained personnel and the absence in the country of a full realization of the value of forest protection and of reforestation. The forest laws are in many respects excellent: what is required is their enforcement, together with an increasingly progressive policy of tree planting. There has been considerable improvement in the past few decades. Until recently the foresters were local police officials aided by about thirty professional foresters who had received short-term training mainly at Austrian schools of forestry. The first Greek school of forestry was established in 1896 at Vitína, principally for training forest guards. A law in 1917 provided for a higher forestry school at Athens to give a complete four-year course. Attempts were made to improve management, especially in the state-owned forests. These, as well as certain private forests, have been heavily burdened with various rights of use which have resulted in serious damage, particularly through the unrestricted grazing of sheep and goats. The forests themselves were not subject to a land-tax, but forest products are taxed at rates varying according to the nature of the product and the character of the ownership. There are, however, certain exceptions, the most important being fuel harvested by the peasants for their own use. From 1917 onwards further laws were passed aiming at better fire protection, the reforestation of denuded land, the codification of existing rights of users and improved management of all forest lands, both public and private.

Since 1937 there have been further reforms in forest policy and administration. The principal features are:

(1) Total or partial prohibition of grazing, especially of goats,

Table of forested areas (in hundreds of acres) by classes of owners, systems of management and regions

Region	State	Communes	Corporation	Ecclesiastical	Private	High Forest	Coppice	Coppice standard	Total
Central Greece and Évvoia	6,155	293	1,138	445	3,332	3,287	2,832	5,244	11,363
Pelopónnisos	4,937	25	26	399	1,348	2,912	702	3,121	6,735
Kikládhes	—	—	—	—	—	—	—	—	—
Ionian Islands	44	5	—	—	193	62	120	60	242
Thessalía	2,409	927	371	432	1,421	1,730	3,657	173	5,560
Makedhonía	10,419	630	483	672	2,981	4,061	8,829	2,295	15,185
Ípiros	1,824	306	237	42	119	722	1,328	478	2,528
Krítı	—	158	—	40	198	124	148	124	396
Aegean Islands	37	326	—	129	620	777	116	219	1,112
Dh. Thrákı	4,008	—	12	70	235	702	2,745	828	4,275
Total	29,833	2,670	2,267	2,179	10,447	14,377	20,477	12,542	47,396

Source: H. P. Kontos, *Journal forestier susse*, vol. 83, p. 196 (Berne, 1932)

within almost all forest areas. Measures were being taken to compensate the peasants and to help them to reorganize their animal husbandry and their farms in general.

(2) Afforestation or reforestation of certain river catchment areas. By 1939 there were thirty-five trained foresters engaged in this work.

(3) Afforestation in general. By 1939, eighteen million trees were said to be planted annually.

(4) Intensification of state forest management. These measures included large-scale construction of forest roads, a work in which many peasants participate in their spare-time on a purely voluntary basis; the creation of modern saw-mills, impregnation plants, etc.; the conversion of coppice and coppice with standards (oak) to high forests; and better utilization of minor forest products such as resin.

(5) Creation of national parks.

(6) Reform of forest taxation.

(7) The encouragement of the idea of co-operative holdings among forest labourers and farmers owning woodland.

The main object of this new forestry policy is to prevent soil erosion, to raise the standard of living of the people, and to prevent the exodus of the mountain population. Already, it is stated, the traditional hostility of these people towards the forests is being overcome. Shortly before the outbreak of war in 1940 a higher school of forestry was started at the University of Thessaloníki and great hopes were entertained that its activities would speedily influence Greek forestry for the better (Plate 29).

Conditions since 1941

Farming in Greece has suffered a series of misfortunes since Italy attacked Greece in October 1940. Winter sowings for the 1941 harvest, delayed by drought, were far from complete; labourers were mobilized, draught animals commandeered, and of the 1,000 tractors in Greek possession at the time of the invasion, only 150 were left in use for 1942. Dhitikí Thráki and eastern Makedhonía, which normally contribute one-quarter of the total cereal output, were seized by Bulgaria in April 1941; the control of transport facilities by Axis forces prevented inter-regional traffic and severely affected the food supply in the large towns; wheat seed from Italy arrived too late for the 1942 sowing, fertilizers could not be obtained, and the weather was unfavourable.

The result of these misfortunes has seriously affected the yields of crops and the number of livestock. The following table gives estimates of the production for Greece before and after the invasion. The territory to the east of the Strimón, occupied by Bulgaria, is excluded, and the 1941 and 1942 figures are probably underestimated.

Production of chief crops in 1,000 *m. tons*

Crop	Average, 1935–38	1941	1942
Wheat	600	450	288
Other cereals	550	200	300
Pulses	62	30	25
Potatoes	130	100	50
Raisins and Currants	170	80	57
Olives	34	20	22
Olive-oil	110	84	80

Many ineffective attempts have been made to increase the yields and distribution of food crops since the war began, but only the government policy of compulsory collection seems to have had any success. By this, farmers had to pay, in the form of a tax, one-tenth of their produce of cereals, pulses, olives and olive-oil, and much of the remaining crop had to be sold to the government at fixed prices; but this has not stopped hoarding by peasants and the famine of 1941–3 has been one of the most disastrous features of the Occupation (see vol. I, pp. 236–8, of this Handbook).

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1 The geographical background to agriculture in Greece is studied by M. I. Newbigin, *Southern Europe* (London, 1932, new edition, 1943).

2. Studies of Greek agriculture in its historical bearings are E C Semple, *The Geography of the Mediterranean Region* (London, 1932) and M I. Newbigin, *The Mediterranean Lands* (London, 1924). The cultivated plants and domestic animals of the ancient world are intensively discussed by V. Hehn, *Kulturpflanzen und Haustiere* (8th edition, Berlin, 1911)

3. The nomadic life of the Vlachs and the practice of transhumance are described by A. J. B Wace and M S Thompson, *The Nomads of the Balkans* (London, 1914) A further account of them, with excellent pictures, will be found in H A Bernatzik, *Albanien* (2nd edition, Vienna, 1932).

4 Detailed statistics of Greek agriculture are given in the volumes of the *Statistique annuelle agricole et d'élevage de la Grèce* (Athènes, annually) Those mainly used in the foregoing account have been the volumes relating to 1937 and 1938, published in 1938 and 1939 respectively Export figures are given in the *Annuaire statistique de la Grèce* (Athènes, annually)

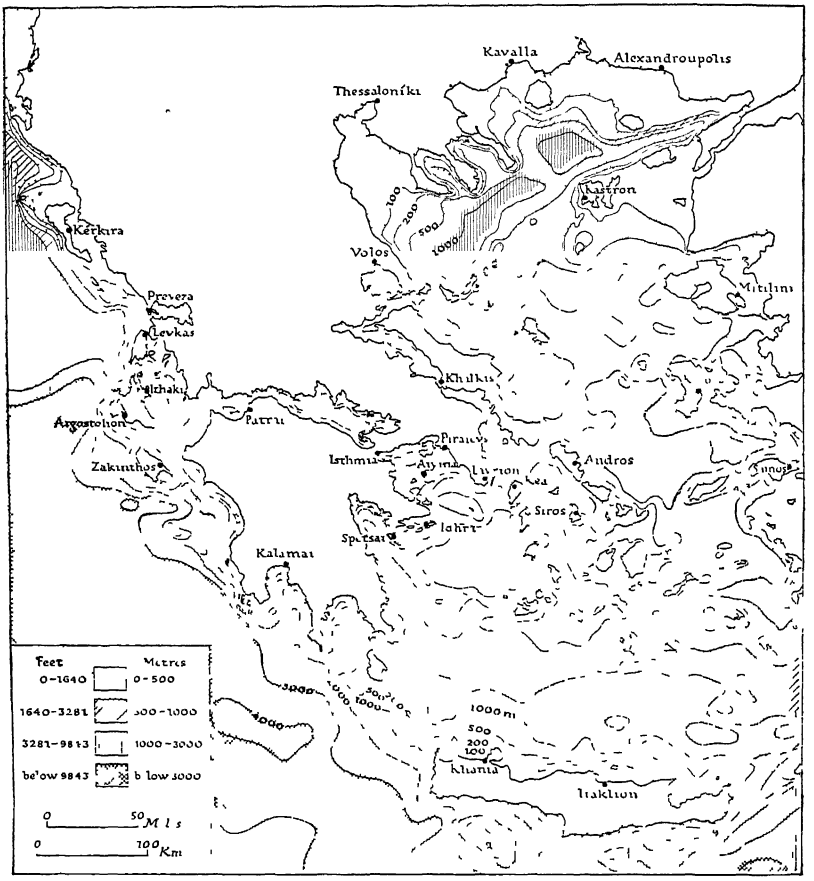


Fig 23 Submarine contours

Based on *Enciclopedia Italiana*, vol XVII, p 786 (Milano, 1933)
The map shows the location of the ports (marine authorities) for which statistics of fish landings are available (see p 93)

The trading arrangements made by Germany in the years immediately preceding the present war are studied by N Momtchiloff, *Ten years of controlled trade in south-eastern Europe* (Cambridge, 1944), which also contains some agricultural statistics. Useful comparative figures for production are given in the Royal Institute of International Affairs publication, *South-Eastern Europe* (London, 1940) See also the *International Year Books of Agricultural Statistics* (Rome, annually)

5 Very many papers and books have been written on the nature, distribution and administration of forests in Greece. Amongst these are

(i) H. Badoux, 'Étendue et distribution des forêts en Grèce', *Journal forestier suisse*, vol 83, pp 195–7 (Berne, 1932).

(ii) N. Chloros, *Die Waldverhaltnisse Griechenlands* (Munchen, 1884)

(iii) E. Geete, 'Greklands skoger', *Skogen*, vol 28, p 22 (Stockholm, 1941)

(iv) H P Kontos, 'Die neue Forstpolitik Griechenlands', *Forstwissenschaftliches Zentralblatt*, vol. 61, pp. 447–54 and 486–91 (Berlin, 1939).

(v) M Nevros, 'Les Forêts Balkaniques', *Revue Internationale du Bois, sixième année*, nos 71–2 (Paris, 1939)

Chapter III

FISHERIES

Introduction Fishing Grounds and Seasons Fishing Craft· Fishing Tackle: Personnel Administration and Research Sponge Fishing Imports and Exports Bibliographical Note

Introduction

The fishing grounds in the waters around Greece are exploited only very locally and the organization of the fishing industry on any significant scale has been largely neglected. The Aegean Sea has quite good stocks of fish of many species but the amount of fish caught is quite inadequate to meet the needs of the country. It is estimated that the annual consumption of fish per head of the population of Greece prior to 1939 was 11 lb., compared with 35 lb. of meat. The latter, however, has always formed a small part of the diet amongst Mediterranean peoples. In comparison, the annual consumption of fish and meat in Great Britain was 47 lb. and 143 lb. per head, respectively. Greeks who live some distance from the coast are unable to obtain fresh sea fish owing to inadequate transport facilities and to the lack of refrigerating plants. Imported salted fish is therefore generally eaten in such areas.

Fishing has, nevertheless, been an important feature of the economy of Greece since classical times and for centuries fishing methods have remained almost the same. The low standing of the industry in recent times, particularly until 1922, was the result of mismanagement, over-fishing and the use of destructive catching methods. Before 1922, when the war in Asia Minor ended, the fishing industry was of a rather simple type; few fish were marketed and most catches were sold locally. After 1922, the development of the fishing industry received a marked stimulus from the arrival of refugee fishermen who settled on the Greek coast. Many of them came from Constantinople, one of the most highly developed fishing centres in the Near East, and they brought with them better vessels, often motor and steam-driven, and better tackle than they found in use by the fishermen among whom they settled. In a few years the markets in the large towns and all the ports were supplied with greater quantities of fish than had been available for many years.

In spite of this, however, the recorded landings of fish in Greece during the period 1929–38 have not shown any marked changes, because no major reorganization has been effected, although the government signed a convention with a foreign syndicate for the organized exploitation of the fisheries. The government has also introduced legislation for the conservation of fish stocks, but pernicious methods of fishing have remained, either through actual evasion of the law or through the ignorance of the fishermen.

The figures for catches recorded in each of the years 1929–38 are as follows; they include small amounts of fresh-water fish:

1929	14,621	metric tons	1934	16,068	metric tons
1930	17,206	,, ,,	1935	14,389	,, ,,
1931	17,695	,, .	1936	14,172	,, ,,
1932	17,990	,, ,,	1937	19,324	,, ,,
1933	16,754	,, ,,	1938	23,152	,, ,,

It must be remembered, however, that these figures are only given tentatively Considerable catches are not recorded at all since they do not pass through a market where records are kept, and are sold and consumed locally. Indeed, in the introduction to the official *Statistique sur la pêche en Grèce pendant l'année* 1936 (Athènes, 1938), it is stated that the totals do not appear to correspond with the actual position

The catch of fresh-water fish is relatively unimportant, amounting in 1938 to 3,815 m. tons. The drainage of some of the larger lakes has caused a decline in the value of fresh-water fishing, but the many remaining lakes and rivers still have considerable stocks. The industry is almost confined to Makedhonía and Thessalía where the chief species are carp, bleak, tench, pike and trout.

Fishing Grounds and Seasons

Fishing Grounds

Fishing is carried on in practically all Greek waters, but especially in the sheltered waters of the large gulfs and channels, such as that between the island of Évvoia and the mainland. Fishing is also important off the south coast of Lésvos, partly as a result of its proximity to the coast of Asia Minor, and off the north coast of Kríti, while most of the Greek islands have fisheries that satisfy local requirements. No two sources agree as to the main fishing grounds, but there is no doubt that nothing exists in Greek waters in any way comparable to the rich grounds of the North Sea. This comparative

poverty is due in part to the uneven sea-floor and the narrow continental shelf in the Grecian archipelago. The Aegean is smaller than the North Sea, but it has considerable areas with depths of over 100 fathoms and, in places, over 500 fathoms (Fig. 23), while the North Sea, except for the waters off southern Norway, has no depths greater than 100 fathoms The narrow continental shelf is a common feature of the Mediterranean basin, and is accompanied by relatively few species of fish as compared with Atlantic and North Sea waters. Fish such as cod, halibut, and herring, which are high in food value and which are important articles of food in north-western Europe, are only caught in abundance in waters colder and less saline than those of the Mediterranean. On the other hand, the west coast of Asia Minor would present considerable opportunities to Greek fishermen were these coastal waters not closed to them by Turkey.

Fish Species

The catch of sea-fish in 1938 (19,337 m. tons) was made up as follows (to the nearest metric ton):

	Deep Sea	Lagoons, brackish ponds and small *madragues* (fish traps)
Fish	16,016	1,944
Crustacea	446	24
Cephalopods	861	5
Other marine products	35	5
Total	17,358	1,979

Source *Annuaire statistique de la Grèce*, 1939, p. 132 (Athènes, 1940).

Many of the species caught in Greek waters are without common English names The most important families are the *Sparidae*, *Clupeidae* and *Scombridae*. The *Statistique sur la pêche en Grèce pendant l'année* 1936 gives the catches by species, though in some cases the Greek names refer to several species. The family *Sparidae* or sea bream family accounted for 3,175 tons out of a total catch of 9,562 tons. The most important species caught are shown in the table on p. 91.

Among other species of fish, flying-fish (two species of *Exocoëtus*) are common in Greek waters. Some 9% of the sea fish catch in 1936 were composed of crustacea (chiefly shrimps—*yarídhes*) and cephalopods (largely octopus or devil-fish—*oktapódhia*, with some

Chief Species of Fish caught in 1936

Family	Species	English name	Greek name	Total catch—metric tons
Sparidae	*Smaris* spp		*smarídhes*	2,052
	Box spp		*gópes*	508
	Oblata melanura	blacktails	*melanoúria*	39
	Chrysophrys aurata	dorados, gilt-heads	*tsipoúres*	53
	Dentex spp		*fankriá, sinagridhes*	79
	Sargus salvani		*spária*	49
Clupeidae	*Clupea sardina*	sardines	*sardhélles, frísses*	1,093
	Clupea engraci-cholus	anchovies	*yávria, atherines, hapsiá*	442
Scombridae	*Scomber scomber*	mackerel	*skómpri, kolií*	49
	Scomber colias			
	Pelamys sarda	pelamides, short-finned tunny	*palamídhes*	355
	Thynnus sp	bonitos	*lakérdhes*	
	Thynnus spp	tunny	*thínni*	9
Triglidae	*Trigla* sp	red mullet	*barboúna, koutsomoúres*	839
Mugilidae	*Mugil cephalus*	grey mullet	*kefália*	431
Gadidae	*Gadus aeglephinus*	hake	*vakaláïa*	397
Carangidae	*Trachurus* spp.	horse mackerel	*safridhia*	257
Raiidae	*Raia* sp	rays	*salákhia*	108
	Torpedo spp			
Lamindae	*Lamia* sp	dog-fish	*skulópsara*	186
Muraenidae	*Conger* spp	conger-eels	*mounkriá*	14
	Anguilla vulgaris etc	eels	*hélia*	63
Scorpenidae	*Scorpaena* sp	scorpion-fish	*skorpí*	141
Percidae	*Labrax* spp	bass	*lavrákia*	18

cuttle-fish or ink-fish—*soupiés*, and squids—*kalamária*). Some of these are regarded as great delicacies by the Greeks (Plate 31). There are practically unlimited supplies of shell-fish in the Aegean.

Some of the fish most important to Greece are migratory or surface-feeding in habit, such as sardines, anchovies, pelamides, bonitos and tunny. The fisheries for these species are mostly

open- or deep-sea and they present the greatest possibilities of any for expansion, but this has been made impossible hitherto owing to inadequate equipment. Longer expeditions, for which larger vessels (about 100 tons gross) must be used, are necessary, and also adequate provision must be made for refrigeration both on board the fishing boats and on shore until the catch is finally disposed of to the consumer, for even catches made on the shortest of these long voyages are liable to decompose in the warm climatic conditions of the Mediterranean summer. Furthermore, full advantage of the possibilities of the fishing industry cannot be taken until scientific exploration of the Greek seas has been undertaken and until accurate information on their fish population, and more particularly on the movements and habits of the migratory species, has been obtained.

Fishing Seasons

The fishing seasons are obviously related to the movements of fish and the details of the fisherman's year in various parts of the country must differ considerably at a given time. Among the fish caught in January, blacktails are perhaps the most important During the month of February, horse mackerel begin to appear in certain parts, while in March all kinds of mullets are caught, especially in the Mesolóngion and Agoulinítsa lagoons. April and May are the months with the richest fishing, because during this period many fish come into the coast to spawn The regular fishing for tunny, which is chiefly carried on off the east coast of Greece and among the Aegean islands, begins in June, and about the end of the month the systematic catching of horse mackerel, mackerel and sardines commences. Fishing in July is for the most part similar to that in June. One of the species of mackerel, *Scomber colias*, is caught especially in August; it is excellent for eating and a saying runs: 'Everything in season and the *kolιós* in August'. From 15 August to the end of September, however, fishermen in most cases rest because it is sometimes said that, at this time of the year, the sea-water becomes sour and spoils the nets. Actually the temperature of the sea is at its height at this season and the fish are compelled to seek deeper and cooler waters, where fishing is more difficult and not so profitable. At the beginning of October, the fishing for red mullets begins and other species caught during the month are the two species of *Box* (*gópes*) and young sardines. During the month, pelamides and mackerel are also caught and these fisheries continue in November and December.

Landing of Catches

According to the official statistics for 1936, the Pelopónnisos had the largest catch of sea fish with 21 %, the Aegean Islands (16 %), Dhitikí Thrákı (15 %), and Central Greece and Évvoia (14 %) were next in order of importance. The landings by port (i.e. marine authority) show that Pátrai, Mitilíni, Vólos, Kaválla, Khalkís and Thessaloníki are the most important fishing centres (see following table). Pátrai had the largest sardine and anchovy catches in 1936, Mitilíni had the largest catch of *smarídhes*, and Vólos had considerable catches of sardines, anchovies and *smarídhes*. Khalkís had nearly half the total catch of short-finned tunny and bonitos, while Kaválla had important landings of *smarídhes* and sardines and Thessaloníki also of sardines.

The Landings of Fish by Ports, 1936

Port	Sea fish (metric tons)	Maximum number of vessels fishing	Maximum total tonnage	Maximum number of fishermen
Aíyina	207	38	65	223
Alexandroúpolis	349	84	88	157
Ándros	29	18	27	87
Argostólion	109	22	53	94
Ídhra	40	22	20	59
Iráklion	206	46	169	238
Isthmía	226	17	23	35
Itháki	27	13	17	36
Kalámai	285	144	236	421
Kástron (Límnos)	279	39	51	151
Kaválla	862	61	102	177
Kéa	7	3	4	7
Kérkira	438	70	148	225
Khalkís	697	120	221	632
Khaniá	192	58	172	215
Khíos	331	58	244	298
Lávrion	172	37	151	143
Levkás	75	53	90	269
Mitilíni	935	154	292	376
Pátrai	1,190	91	454	579
Piraiévs	432	143	294	488
Préveza	146	62	61	206
Síros	295	155	248	732
Spétsai	91	38	58	147
Thessaloníki	669	99	305	392
Vathí (Sámos)	313	43	238	220
Vólos	868	117	228	478
Zákinthos	91	17	87	90
Total	9,562	1,822	4,146	7,175

Source *Statistique sur la pêche en Grèce pendant l'année* 1936, pp. 10–22 *passim* (Athènes, 1938)

Fishing Craft

The total number of boats employed in fishing varies from one year to another and also from season to season. The number of fishing vessels working in 1936 was 1,822 of 4,146 tons and in 1938 the number was 2,193 of 4,647 tons. These figures, however, represent maxima and the minimum numbers working in 1936 were 533 of 1,466 tons and 671 of 1,765 tons in 1938. The distribution of vessels according to home port may be seen from the table on p. 93. In 1932, 136 out of a total of 2,480 fishing boats were mechanically propelled, while in 1935, 130 out of a total of 1,637 boats occupied in fishing were so propelled, two-thirds of these being used for trawling. These vessels are from 5–20 tons gross, with a few up to 40 tons gross, and are equipped with 10–20 h.p. petrol engines. Greek fishing craft show considerable variety of design but basically it is usually that of the small caique, with its raked stem, transom stern and considerable sheer fore and aft. The hulls are painted white, green or deep-blue, with one or more brilliant stripes extending the whole length of the vessel; 'eyes' are also painted very frequently on the bows. The sails are sometimes dyed red with a preservative (Plate 30).

Fishing Tackle

There has always been considerable interchange of ideas between the various Mediterranean countries, and the methods used by Greek fishermen are, with few exceptions, similar to those used in other parts of the Mediterranean. Until 1922, the most simple types of fishing were in use, with hooks and lines, and nets fixed on the sea bed (set nets) predominating, while the most highly developed form of fishing was with beach seines, which were used in a few favourable localities. Trawling was little known, except in the case of Italian fishermen from Naples and the Adriatic who came to fish in Greek waters. Fishing vessels were small, though of diverse types, and used mostly oars and sails. Fishing in Greece to-day may be conveniently divided into coastal fishing, deep-sea fishing and lagoon fishing, each with its own tackle.

Coastal Fishing

Inshore fishing is mainly carried on from small boats not exceeding 3 tons, which operate from the shore. The simplest method is with small nets, of which there are two main types: simple nets or gill nets

(*apládhika*) and composite nets or trammel nets (*manoména*). The former consist of a single net of linen, silk, woollen or cotton yarn, while the latter is composed of three layers of simple nets, each with different sizes of mesh. These nets are used at all seasons for various species of fish, the simple net chiefly for small fish. The long lines used for fishing on the coast are of two types, those for small fish, with 100–400 hooks, which are attached by subsidiary lines, and those for larger fish, with up to 200 hooks of a larger size. The lines are weighted with lead and the ends rise to the surface and are buoyed. They are set from small rowing boats and sailing boats, usually manned by a crew of three. Set-nets are also used from rowing boats, each of which carries about 30 sections of net, together making a total length of some 900 fathoms. The most elaborate method of coastal fishing is, however, with the beach seine or trawl (*tráta*), with an estimated annual catch of 1,500 metric tons. The net consists of two wings supporting a bag, and is buoyed with large cork floats; it is set from small boats in a semi-circle and then each wing is dragged ashore by mooring ropes, the men hauling on heaving lines from the rope, each weighted with a wooden bobbin, round their waists. Both parties gradually converge on one another, while towards the finish the fishermen put off in a boat, shouting to drive the fish into the bag at the end of the net. This method can be used all the year round where the sea-bottom and the beach are not too rough, but it is best in spring and summer. During the latter season, however, the fish come to spawn in the warm shallow waters off the coast and the nets destroy the spawn; thus it is most wasteful and at the same time the yield is poor compared with the effort required. Some of the coastal fishermen use dynamite, a practice which has been made illegal, and is the most wasteful of all methods. Sticks of dynamite with a lighted fuse are thrown among a shoal of fish, which are suffocated by blast and rise to the surface; they are usually used for bait. Many times more fish, however, are destroyed than caught, and sink to the bottom; in addition, fish fry, and the plankton upon which they feed, are destroyed, while migratory fish usually desert the water where dynamite is used. Other fishermen use herbs,* found growing on mountains, which have toxic properties, and which poison fish when placed in the water; the fish are usually stupefied and are netted when they float to the surface. This is also a wasteful method, for most of the fish affected are too small to have a market value and are left to die. Another method of catching

* Species of *Euphorbia* (spurge) and also *Verbascum* (mullein) are used, under the name of *flómos*.

migratory fish was by means of strong fixed nets installed near the shore. The state possessed the right to install them, but they were leased to private enterprises. In 1937, of about 130 nets, 95 were located on the coast of the Pelopónnisos. Though intended for tunny, few of these are caught; only small catches of bonito and mackerel are taken.

Deep-sea Fishing

Deep-sea fishing may be further divided into fishing devoted to demersal fish (which live on or near the sea bottom) and that devoted to migratory pelagic fish. The demersal species are caught mainly with trawls which are larger than those used in inshore fishing. The trawls are dropped in depths of about 80 fathoms and dragged along the sea bottom, usually by power-driven boats (*mechanotrátes*) but also by sailing vessels (*anemotrátes*). The boats operate in pairs and are usually of 15–25 tons gross, exceptionally of up to 45 tons gross, and have practically no refrigeration facilities. Italian fishing boats of up to 120 tons gross also operated in this fishery in Greek waters before 1939, they were based mainly on Thessaloníki.

The deep-sea fishery for migratory species is considered to be one of the most important in Greece, in view of the greater percentage of migratory fish, compared with free-swimming and bottom-feeding fish. It presents the greatest scope for increased catches, for only a small percentage of the fish passing through Greek waters are caught. Sardines, anchovies, mackerel and tunny are the chief catches. The tunny consist mostly of short-finned tunny and bonitos; they migrate through the Aegean Sea to the Black Sea in the spring and return in the autumn. Sardines are caught throughout the year, but especially in the spring and summer. Fishing is carried on with circular drift nets called *gri-gri*; these are plunged in the water and closed underneath when sufficient fish are caught During the daytime, baits (bad herring, etc.) are used occasionally, but during the night strong acetylene lamps serve to attract and dazzle the fish; this is a common and remunerative practice, especially among groups of boats Ring nets are also utilized.

Lagoon Fishing

Lagoons and lakes, which are linked directly with the sea, are found along several parts of the Greek coast; they are used for a special type of fishing. A bamboo net is fixed at the outlet to the sea, and it is then gradually moved up the lake at night until the fish are

trapped in a small area and can be captured with scoops. Mullets form nearly half the catches from these lakes and the fish pens or *madragues*; carp, eels, some species of tunny, and gilt-heads are also caught. Some 40 % of the total catch in lagoons, etc., in 1936 was taken in Dhitikí Thráki, 24 % in Central Greece and Évvoia and 14 % in the Pelopónnisos. The most important lagoons are those of Vistonís (Dhitikí Thráki), Mesolóngion, and Agoulinítsa and Mouryía on the west coast of the Pelopónnisos. They are all state property and are leased to concessionaires, usually for a period of ten years; the fish are partly consumed locally, including the mullets, after the roes are extracted to make *boutargue*, a kind of caviar. The eels from Mesolóngion are exported to Italy, while those from Vistonís are exported to Germany in rail tank cars containing lake water. Some of the yields are comparatively poor owing to the inefficiency of the traps, the maintenance of which has been neglected.

Personnel

According to the Greek census of 1928, the number of persons employed in fishing was 14,941. By 1939 they were estimated at 20,000, but it is difficult to assess this number with accuracy because the fishermen are only employed seasonally. Official statistics differentiate between fishermen and sailors on board fishing vessels; but since they usually perform a number of common tasks on board, both categories have been grouped together in the table on p. 93. The maximum total number of persons thus employed in 1936 was 7,175 and in 1938 it was 8,649. Between one-third and one-half of these were in the provinces of Central Greece and Évvoia, and the Pelopónnisos.

Working Conditions

About a third of all Greek fishermen are independent, working in pairs, making their own nets and subject to seasonal unemployment in the industry. The remainder are employed by entrepreneurs or wholesale dealers, who finance the fishing operations and are therefore in a position to impose extortionate terms on the hard-pressed fisherman who gets a very small return as a result of paying up to 100 per cent interest on loans. Other dealers, who supply nets, fuel and other equipment to the fishermen, frequently make excessive charges in return for granting credit.

The dealers have shown no inclination to improve the market organization, and, as a result of lack of suitable refrigerated storage and of poor means of transport, it is impossible to keep the fish and release it gradually on the market. Thus prices differ widely with the natural fluctuations in catches, and also vary greatly between one locality and another; the price of sardines varies between 2 and 15 drachmae per oke (2·8 lb.), while prices in Piraiévs and Thessaloníki are twice as high as in the Kikládhes and Kríti. Exploitation by middlemen frequently raises the retail prices to three times the wholesale prices. The earnings of the fisherman do not allow more than mere subsistence. The earnings on a deep-sea trawling vessel are about 1,200–2,200 drachmae per month, and in addition some food is given. In *gri-gri* fishing and in short-distance trawls, a share in the profits is the usual type of remuneration, but the earnings are still very small.

There are in Greece a small number of official agencies called 'Funds for Fishermen', the object of which is to grant credit facilities under favourable terms in order to rescue the fishermen from their present precarious position With the exception of the fund set up in Thessaloníki, they have not operated successfully owing to lack of resources and of security for loans.

The workers in the fishing industry are insured against old age, incapacity and death on a contributory basis.

Administration and Research

The fishing industry comes within the province of the Ministry of National Economy. Some of the first steps to develop the industry were taken in 1929, when the Greek government signed a convention with a foreign syndicate for the organized exploitation of the fisheries, both sea and fresh water. Special attention was to be paid to research on tunny fishing, including the locating of five suitable areas for fishing and the setting up of suitable preserving centres and markets Two motor trawlers were to be introduced for deep-sea fishing, especially in the northern Aegean and in the waters south of Kríti; these vessels were to act as mother ships so that the small fishing fleets need not put back into port. The scheme does not, however, seem to have had much success. Early in 1930, various regulations were issued for the protection of fish Motor trawlers were prohibited from fishing in the Gulf of Évvoia and shore fishing was forbidden during the months of June, July and August in

certain areas, notably the Gulf of Thessaloníki and off the island of Sámos.

In recent years, upon the request of the Minister of National Economy, the Supreme Economic Council has made a thorough investigation of conditions in the fishing industry. Its conclusions, published in 1938, are of far-reaching importance and include the following recommendations to the government: (1) a research institute should be set up for the scientific investigation of the seas round Greece, especially on the migratory habits of tunny, the results of which should be made available to the fishing industry; (2) stricter and more effectively enforced legislation for the conservation of the resources of the sea should be introduced; (3) there should be improved supervision of the state-owned enclosed fisheries in order to increase the yield of fish; (4) the creation of modern fish markets with adequate storage and refrigeration facilities, and the provision of specially equipped means of transport are urged.

The main provisions for the conservation of fishing have been, firstly, to make fishing by dynamite and by strong lights at night illegal, and secondly, to make various restrictions on trawl fishing. In the case of the latter, it is prohibited for four months during the summer in order to protect spawn, while the use of nets with a mesh smaller than 8 cm. for shore trawls and 15 cm. for sea trawls was forbidden. This is too small, however, for in most countries the minimum sizes necessary to prevent the capture of very young fish are 12 and 25 cm. Sea-trawl fishing is also forbidden within one and a half miles of the coast. Similar but lighter restrictions were imposed on *gri-gri* fishing. However, one of the main difficulties is that these measures are not adequately enforced, for the very long coastline requires a large number of policing personnel.

It would seem that if credit on the lines of agricultural credit were granted to fishermen (by banks under government supervision) at low rates of interest, and if marketing conditions were improved, a considerable supply of cheap fresh fish could be made available, especially to the poorer sections of the community.

Sponge Fishing

Sponge fishing has been from early times an important industry in Greece, and to-day the trade, which is handed down from father to son, retains its value because of the appreciable export of sponges. Greek fishermen are the chief sponge divers of the eastern

Mediterranean, and they predominate in sponge fisheries in many parts of the world, for even if they do not actually engage in the fisheries they supervise them.

The total catch of sponges in 1936 reached 64 5 metric tons, valued at 39·7 million drachmae, while in 1938 it only amounted to 39·6 metric tons. The census for 1928 gives the number of sponge fishermen as 222. The numbers vary between summer and winter, the official figures for 1937 being 780 and 74 respectively; the numbers of boats employed vary in the same way, as shown in the following table, with comparative figures of numbers and categories of vessels and fishermen employed for 1928 and 1937:

Vessels and personnel engaged in sponge fishing

Year	Season	Fishing vessels		Auxiliaries		Total		Personnel			Total
		No	Tons	No	Tons	No.	Tons	Captains	Divers	Sailors	
1928	Summer	59	324 4	16	497 4	75	821 8	75	269	331	675
	Winter	—	—	—	—	—	—	—	—	—	—
1937	Summer	72	408 7	26	665 4	98	1,074 1	95	293	392	780
	Winter	11	55 8	—	—	11	55 8	11	28	35	74

Source: *Annuaire statistique de la Grèce*, 1939, p. 133 (Athènes, 1940)

Sponges grow on rocky shoals in sea-water and are harvested in four ways, according to locality and depth of water: by hook or harpoon, by dredge or trawl, by diving, and by machine diving. The trawl is destructive to the sponge beds since it is dragged along the bottom and gathers young sponges. The machine-diving method is the only one which can be used in deep water, and since the sponge beds in the shallow water near the coast are in danger of complete exhaustion, the method is the chief one in use at present. Sponge culture has not yet developed on a commercial basis and restrictive measures are needed to conserve the sponge beds, for those inshore are not being allowed to regenerate.

The machine-diving suit was first introduced in the Aegean in 1866, but for a long time there was a high mortality rate among the divers from caisson disease, which is caused by the sudden variations in pressure during the descent and ascent; it was still more pronounced when divers did not use protective equipment. Government regulations, though they have been evaded, have largely

eliminated the disease and only a few deaths now occur among the divers. All vessels engaged in sponge fishing must be inspected by officials before leaving harbour.

Sponge fishing is carried on from the ports of Ídhra, Vólos, Aíyina, Kástron (Límnos), Khalkís and Sámos. Over three-fifths of the number of divers and sailors, and three-quarters of the vessels by tonnage, are based on the island of Ídhra. Summer is the most important season for sponge fishing (see table on p. 100), lasting from April or May to September or October. The early part of the summer is usually spent over the sponge beds in Greek waters and those in the Dodecanese. Later, the boats move to the coasts of Egypt, Cyrenaica, Tripolitania or Tunisia. The winter season, from December to March or April, is spent mostly near the home ports.

Three qualities of sponges are gathered and the total value of the catches fluctuates considerably owing to variations in the quantity of sponges of each quality; those sponges collected in foreign waters obtain almost twice the price of those taken in Greek waters. Expressed as an average of the four years 1936–39, 42 per cent of the total weight of sponges came from foreign waters, but this quantity accounted for 53 per cent of the total value. The waters off Benghazi in Cyrenaica are the most important single area. The captains of vessels grade the sponges into three qualities and they are sold accordingly, the brokers, however, regrade into four classes, each with three or four qualities. The classes are: 'Honeycomb', which is exported especially to Great Britain, both in the natural state and bleached; 'Fines', some of which are exported to the United States and are used for industrial purposes, such as in leather-dyeing and in the manufacture of enamel ware; 'Elephant ears', used, especially in Germany, in industrial processes, and exported in natural cones or cut shapes; 'Zimoccas', which are used in industry both in the United States and Germany Greek sponges have met tariff measures in many countries, especially in the United States, but the Greek and eastern Mediterranean sponge beds have not been affected by the disease which has ravaged the sponge beds of Florida and Central America in the last decade, and their importance is likely to increase.

Imports and Exports

A considerable quantity of fish must be imported into Greece owing to the inadequacy of home-caught supplies, and imports in 1938 amounted to 21,160 metric tons valued at 270·2 million drachmae.

The following table, which gives comparative figures for two sample years, 1934 and 1938, shows that by far the greater part of this is salted fish, particularly salted cod (*bakálaros*).

Imports and Exports of fish products in 1934 *and* 1938

Product	Imports				Exports			
	1934		1938		1934		1938	
	Quantity (met tons)	Value (1,000 dr)	Quantity (met tons)	Value (1,000 dr)	Quantity (met tons)	Value (1,000 dr)	Quantity (met tons)	Value (1,000 dr.)
Fresh fish	1,817	9,204	5,422	38,834	483	9,708	141	6,123
Salted fish	5,129	64,376	2,282	80,466	22	514	11	352
Salted cod	10,405	84,329	12,790	131,695	15	204	15	232
Mussels, oysters & others in boxes	212	5,144	65	1,225	2	73	1	44
Sardines, in boxes or barrels	195	4,358	256	3,991	0 9	25	7	265
Bovtargue and caviar of all types	503	11,382	345	13,936	6	349	3	342
Sponges	3	808	0 1	69	29	14,523	48	39,114

Source *Annuaire statistique de la Grèce* 1939, p 134 (Athènes, 1940)

Furthermore, this salted fish is about half the price of fresh fish. The cod was imported mostly from France and Newfoundland in 1936, but in 1937 the most important suppliers were Newfoundland, Norway and Denmark. Most of the remaining salted fish consists of salted or smoked herring (*rénka*), which is almost entirely supplied by Great Britain, with small quantities from Holland. The imports of cod and herring remain fairly steady. Fresh fish is largely imported from Turkey. Sardines are imported in tins and barrels from Portugal and Spain. A small number of factories exist in Greece for packing sardines in salt or in brine in barrels, as on the islands of Thásos and Lésvos, and others pickle fish and prepare fish pastes and other products, as at Thessaloníki and Piraiévs. Thus, Greece is becoming more independent of supplies of sardines from Portugal and Spain. Other imports include tinned salmon from Alaska. Fishing nets were formerly imported to some extent from Marseilles, Trieste and Naples, and though there are no Greek factories which make nets, the fishermen now mostly make their own, often using home-produced twine and silk.

Only small quantities of fish are exported, amounting to 225 metric

tons, valued at 46·5 million drachmae, in 1938. This is mostly fresh fish, which is exported to Jugoslavia, Italy and Germany. The latter country takes a large part of the catch of eels. Sponges are the largest item by value on the list of exports. In 1938, these went mostly to Great Britain and France, with small quantities to Germany and the United States, but in 1939 the latter was the most important buyer, partly owing to the failure of the Florida beds.

Bibliographical Note

(*a*) A short, though dated, account of the fisheries of Greece is given in E G Mears, *Greece To-day* (Stanford, Cal., 1929). Comprehensive details of fishing in Greek waters are given in a general article on fishing in *Megálē Ellēnikē Enkiklopaídheia*, vol III, pp 783–800 (Athínai, 1927).

(*b*) The chief sources of statistics are the *Annuaire statistique de la Grèce*, 1939 (Athènes, 1940) and the *Statistique sur la pêche en Grèce pendant l'année* 1936 (Athènes, 1938), which gives detailed figures on all branches of fishing, these must, however, be regarded only as estimates

(*c*) A number of scientific papers on various fish, especially tunny and eels, have been published by G. Athanassopoulos from 1924 onwards in the *Bulletin de l'Institut Océanographique* (Monaco) and in the *Praktiká tis Akadimías Athínon* (Athens), which is in Greek with French summaries; some details of fresh-water species are given in G Athanassopoulos, 'Particularités de la distribution de l'ichthyofaune des eaux douces en Grèce', published in the *Verhandlungen der internationalen Vereinigung fur theoretische und angewandte Limnologie auf der siebenten Mitgliedversammlung in Jugoslavien*, pp 117–21 (Beograd, 1935)

Chapter IV

MINING AND INDUSTRY

General Features Summary of Industrial Production (By Value) Mines and Quarries· Textile Industries Chemical Industries General Engineering Industries Food and Drink Industries Tanning and Leather Industries Building Industry Timber and Wood Products Tobacco Manufactures. Rubber Manufactures Fuel and Power Conditions since 1941 Bibliographical Note

General Features

The industries of Greece are small by western European standards, but their growth in recent years represents a tremendous achievement for such a poorly endowed country. During the nineteenth century manufacturing activity was limited to shipbuilding in Síros, a gunpowder factory in Athens, an iron foundry in Piraiévs and numerous brick and tile factories serving local areas There were, too, a number of flour mills and olive oil presses, but these were all small and somewhat primitive, and the Greeks relied almost entirely upon imported manufactured goods and the products of domestic industries for their essential industrial needs.

The war of 1914–18, bringing an acute shortage of shipping and an increased demand for industrial products, demonstrated the necessity for home-manufactured articles as part of a planned national economy. But it was not until the large influx of refugees from Asia Minor in 1922–23 created a plentiful and cheap supply of labour and at the same time set the problem of how to absorb about 1,400,000 people into the economic life of the country that the industrialization of Greece became both practicable and essential New settlements were rapidly built on the outskirts of the larger towns and cities and it was here that the new factories were set up. By far the largest number are located in the Athens-Piraiévs district, and this area is the only industrial region of any magnitude in Greece to-day. Its growth within the last two decades has been extraordinary—in 1920 it had a population of 426,000, by 1940 it had risen to 1,125,000. There has been no census of industrial enterprises since 1930, but in that year one in every five factories throughout the country was in Athens-Piraiévs, and of those factories employing 25 persons or more, approximately half were located in

this district. During the past decade the centralization of industry has become even more pronounced, almost 30 % of the new establishments being founded in Athens-Piraiévs. The failure to develop industries in other regions is largely due to the high municipal, community, road and port taxes in many parts of the country, as contrasted with the easy and cheap shipping facilities in Piraiévs, the abundant supply of electric power from the *Electric Light Company*

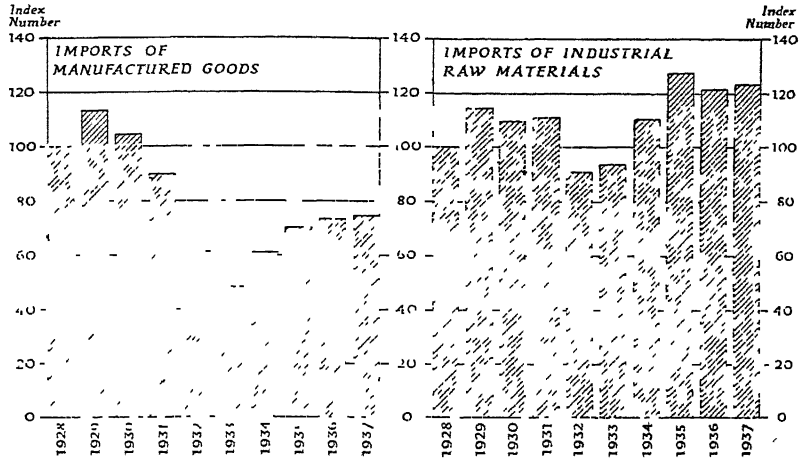


Fig 24 Imports of manufactured goods and industrial raw materials, 1928–37
Based on official sources.
The index numbers are based on imports during 1928 (=100).

of Athens and Piraiévs, and the proximity of a large labour supply and ready demand in the capital.

The financial policy of the Greek government has been partially responsible for the growth of industry in the last ten years. The critical position in 1932 (see p. 167) brought with it the necessity to reduce the export of capital. Partly to accomplish this, the government restricted imports of manufactured goods by protective tariffs (Fig 24), but allowed the import of machinery free of duty; preference was also given to Greek industries for manufactured goods required by the state. The policy was largely successful, and industries that had been driven into bankruptcy during the world economic depression of 1929–33 now revived and prospered Industrial credit, formerly difficult or even impossible to obtain, became easier and certain credit establishments, notably the National Bank, gave effective support. At the outbreak of war with Italy in

October 1940, the financial position of most industrial concerns, commonly organized as limited liability companies on a family basis, was sound.

The industries rely mainly on raw materials produced in Greece, and their relative importance, as the basis of manufacture, has steadily increased; for while, in 1928, home-produced raw materials accounted for 58 % of the total consumption, by 1939 the percentage had risen to 80. In tanning, metallurgy, spinning, chemicals, food manufactures, and building, indigenous raw materials account for three-quarters of the requirements, while the distilling, brick-making, pottery and cement industries rely entirely upon native materials. Greece possesses numerous, though scattered, deposits of most minerals, and although many of them are not fully exploited and the minerals are largely exported in their crude state, their value as an aid to local industry is great. Moreover, Greece is predominantly concerned with agriculture, and the considerable supplies of home-produced cotton, tobacco, olives and raisins are readily utilized in small industrial plants throughout the country.

Despite the increasing use of home-produced materials there has been no decline in the amount of raw material imported into the country for industrial purposes. Indeed, apart from the Greek economic depression of 1932 and 1933, there has not been a year in which such imports have fallen below the 1928 base level of 100 (Fig. 24). This is a further indication of the growth of Greek industry, for the percentage of imported raw materials used in these industries has steadily diminished from 1928 onwards. The principal commodities required from abroad were coal, fuel-oil and gasoline.

The most serious hindrance to large-scale industrial works is the absence of fuel, except for isolated outcrops of lignite and a few traces of oil. Nor have the potential supplies of hydro-electric power been developed to any great extent. Many of the larger factories have now been fitted by British or German firms with power plants; alternatively, they are served by the *Electric Light Company of Athens and Piraiévs*. At one time most of the power plants were coal-driven, but gradually they have changed over to fuel-oil, and to Diesel engines.

One of the characteristic features of Greek industry is the very large numbers of very small concerns, a clear indication of the shortage of capital in the past and the diversity of manufactured products. Apart from such companies as the *Société des Poudreries et Cartoucheries Helléniques* which also owns the shipbuilding yards at Piraiévs, the *Société Anonyme Hellénique des Produits et Engrais*

Chimiques with its large chemical works at Dhrapetsóna and associated iron pyrites mines in Khalkidhikí, and the *Société Anonyme des Brasseries* which has a monopoly on wines and spirits in Greece, there are few plants which employ more than 25 people. According to the *Enterprises industrielles et manufactières en général pendant l'année* 1930, there were 76,591 industrial establishments in that year of which over 90% employed less than six workers. Together they employed some 280,000 people, a number which has probably risen to just less than a million in the last decade, although no official estimates are available. The following table shows the number of establishments and workers for each industry at the time of the 1930 census:

Industrial Establishments in 1930

Industries	Establishments		Workers	
	Number	%	Number	%
Mines and quarries	303	0·4	8,305	3 0
Food and drink	19,485	25 5	46,157	16·5
Chemicals	527	0 7	5,017	1 8
Building	1,493	1 9	29,171	10 4
Power and lighting	294	0 4	6,826	2 4
Metallurgical	94	0 1	833	0 3
Engineering and metals	9,778	12 8	22,055	7 9
Wood and timber	6,574	8 6	16,888	6 0
Leather and animal products	15,657	20 5	32,091	11 4
Textiles	1,018	1 3	22,298	8 0
Domestic spinning	9,419	12 3	25,343	9 0
Paper and printing	1,074	1 4	6,949	2 5
Tobacco	331	0 4	5,347	1 9
Hygiene services	6,912	9 0	12,116	4 3
Transport and communications	1,484	1 9	27,147	9 7
Various	2,148	2 8	13,788	4 9
Total	76,591	100 0	280,331	100·0

Source. *Annuaire statistique de la Grèce*, 1932, p. 161 (Athènes, 1933).

The number of factories, as distinct from establishments (many of which were only one-man concerns), has steadily risen. By 1939 there were estimated to be over 20,000 industrial installations with a value of more than 20 billion drachmae, an increase of some 12 billion drachmae over the 1930 estimate.

The total consumption of manufactured products has mounted steadily to meet the demands of an increasing population and a constantly rising standard of living. By 1937 the consumption was 20% above the base year of 1928, an increase which is more than

met by the growing production of Greek factories (Fig. 25). In 1928, some 41% of the needs were met by imports while in 1937 only 25% were imported. Had the consumption of manufactured goods not been increased, local industry would have been responsible to-day for more than 90% of the country's needs. The rise in the

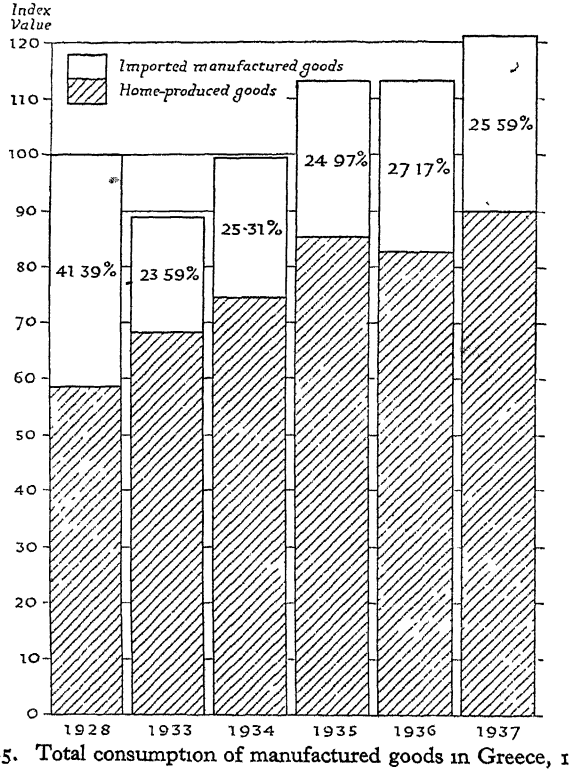


Fig 25. Total consumption of manufactured goods in Greece, 1933–7
Based on official sources
The year 1928 is taken as the base (100)

standard of living is a reflexion of the profound change that has taken place in Greece since the incoming of the refugees. Although young women had come from the islands to find domestic work in the capital before 1923, and women had always been employed on the land and in domestic handicrafts, they had at no time been engaged in factory work. But many of the refugee women in urban centres soon became skilled workers in textile mills, potteries and other factories. As their earning power increased, their purchases of manufactured products rose, thus creating an expanding home market for industrial goods.

Summary of Industrial Production (by Value)

The extraordinary increase in industrial production is shown in Fig. 26. By 1939 the total value of all manufactured goods, including wine and olive oil industries and the products of flour mills, had reached the peak figure of over 14,000 million drachmae, an increase of 100% in ten years. The following table, giving the value of production for individual industries in 1938 and 1939, shows the outstanding importance of textiles, chemicals and food and drink industries, which together account for two-thirds of all manufactured products in Greece. Perhaps a better guide to the remarkable progress is given by the index figures of quantitative output (Figs. 27 and 28). These show a fairly constant rise in production, despite the difficult five years of world industrial depression, 1929–33. The most striking growth was in the making of small mechanical products, which from 1934 to 1937 more than quadrupled in output. On the other hand, there was a slight decline in the metal, leather, paper and clothing industries.

Value of Industrial Production in 1938 *and* 1939

Industry	1938			1939		
	Value (1,000 dr.)	Per cent of total value	Index* figure	Value (1,000 dr.)	Per cent of total value	Index* figure
Metal	67,969	0·5	84	62,519	0·4	97
Mechanical	654,957	4·7	584	560,492	4·1	346
Building	509,619	3·8	149	516,860	3·7	178
Textile	3,669,102	27·1	199	3,859,912	27·4	237
Food and Drink†	2,347,196	17·2	105	2,518,950	17·8	106
Chemical	2,949,238	21·7	178	3,123,879	22·1	189
Leather	1,020,250	7·5	62	927,600	6·5	62
Paper	433,128	3·3	173	498,584	3·5	183
Clothing	40,018	0·3	30	37,500	0·3	13
Tobacco	229,765	1·6	125	234,382	1·6	128
Electricity	1,150,000	8·5	434	1,300,000	9·3	484
Timber and Wood	515,000	3·8	—	472,000	3·3	—
Totals	13,586,242	100·0	168	14,112,678	100·0	179

* Index figure for 1928=100.
† Exclusive of wine, olive and flour mill products.

Source: Production figures throughout the chapter are taken from the *Annuaire statistique de la Grèce* (Athènes, annually), or from official sources.

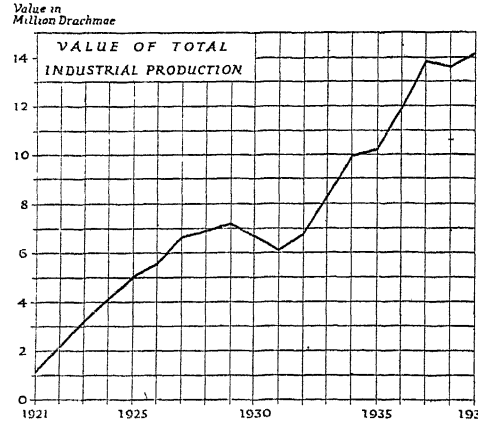


Fig. 26. Value of total industrial production in Greece, 1921–39
Based on figures in *Annuaire statistique de la Grèce*, 1939, p 454 (Athènes, 1940)

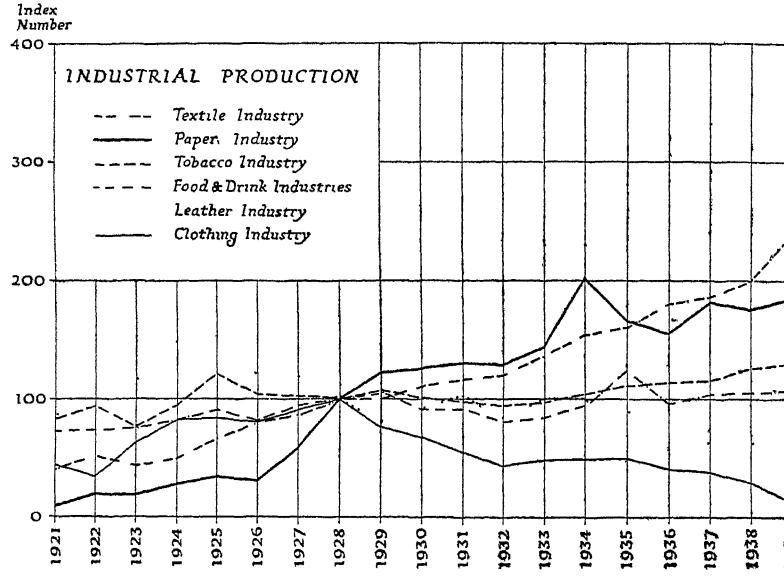


Fig. 27 The trend of industrial production in Greece, 1921–39 (index numbers of the textile, paper, tobacco, food and drink, leather and clothing industries)
Based on figures in *Annuaire statistique de la Grèce*, 1939, p. 454 (Athènes, 1940)
The index numbers are calculated on the basis of the output and value of the respective manufacturing industries in different years, using the year 1928 as the base (100)

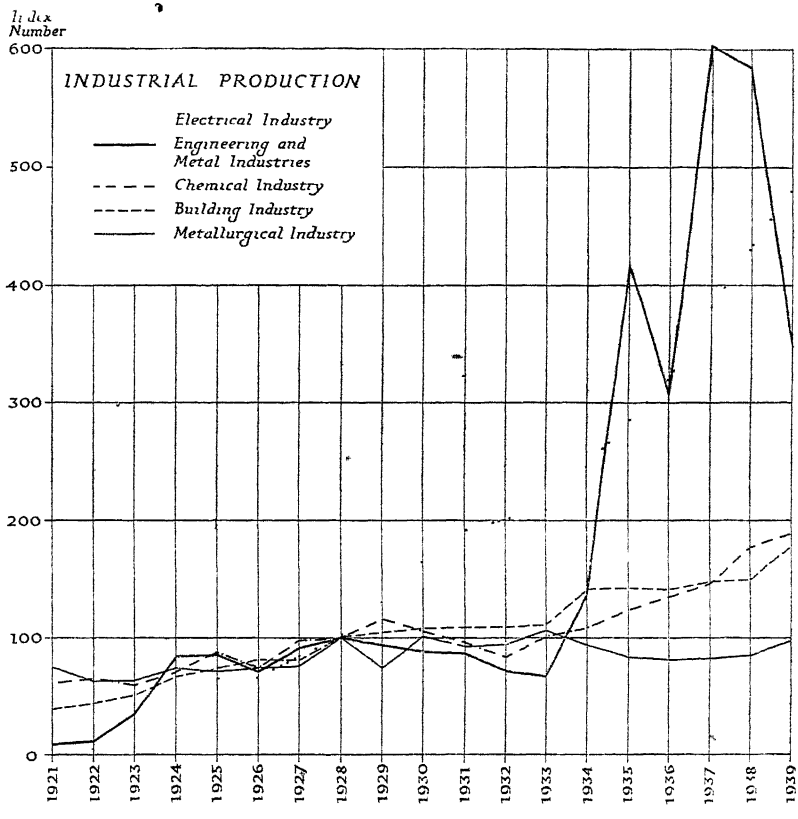


Fig. 28. The trend of industrial production in Greece, 1921–39 (index numbers of the electrical, engineering and metal, chemical, building and metallurgical industries)

Based on figures in *Annuaire statistique de la Grèce*, 1939, p 454 (Athènes, 1940). The index numbers are calculated on the basis of the output and the value of the respective manufacturing industries in different years, using the year 1928 as the base (100).

Mines and Quarries

The mineral resources of Greece are numerous and varied, but they have never been fully exploited, owing partly to the lack of suitable transport facilities, partly to the widely scattered distribution of the relatively small deposits, and partly to the lack of mining engineers and skilled workmen. The development of mining in modern Greece dates from the middle of the nineteenth century, when a Sardinian mine-owner, named Serpieri, discovered that it was possible to extract silver-lead from the slag refuse of the mines of Lávrion, from

which, in classical times, Athens had derived a considerable revenue In 1873 he obtained a concession to work the mines as well as to extract ore from the refuse, though the latter concession provoked a political, and almost an international, crisis. The incident served, however, to draw attention to the mineral wealth of the country, and by 1891 over 450 concessions had been granted A further stimulus was provided by the rising world requirements for base metals and the steadily increasing financial returns from their export. Moreover, the encouragement given to the local manufacture of many metal products which are at present imported, and also to the chemical industry, is likely to create a growing home market. The principal minerals, all of which are associated with the older metamorphic and volcanic rocks of eastern Greece, are for the most part mined by primitive methods, and, with the exception of the small quantity of lead ore smelted at Lávrion, the ores are exported in their crude form or as concentrates.

According to the industrial census of 1930 there were in that year 303 mines and quarries in operation, employing 8,305 workers, or 3% of the industrial population Within the last decade, however, there has been a very considerable increase in these figures. The principal ferrous minerals are iron ore and iron pyrites, while amongst the non-ferrous minerals, manganese, magnesite, bauxite, nickel ore, and chrome ore are the most important (Fig. 29). The output of lignite, which came to 108,000 tons in 1938, is discussed on p. 138, and that of salt, which is a state monopoly, on p. 126.

The table on p. 114 gives the production figures of the leading minerals and quarry products in 1938.

Iron Ore

Deposits of iron ore, though not worked to a great extent, have a fairly high iron content and the production figures are greater than for any other mineral. The ore has been exported since 1880 and reached its peak figures in the first decade of this century when there was an average export of some 600,000 tons per annum. In 1938 about 350,000 tons were mined, and almost the entire production was exported, principally to Germany, Poland and Czechoslovakia. Reserves are estimated to be more than 45 million tons. The chief source of iron ore is in the south-west of the island of Sérifos in the Kikládhes, where there is an annual production of 180,000 tons, and 400 men are employed. The ores (magnetite, hematite and limonite) have an iron content of 50%, but they also contain silica,

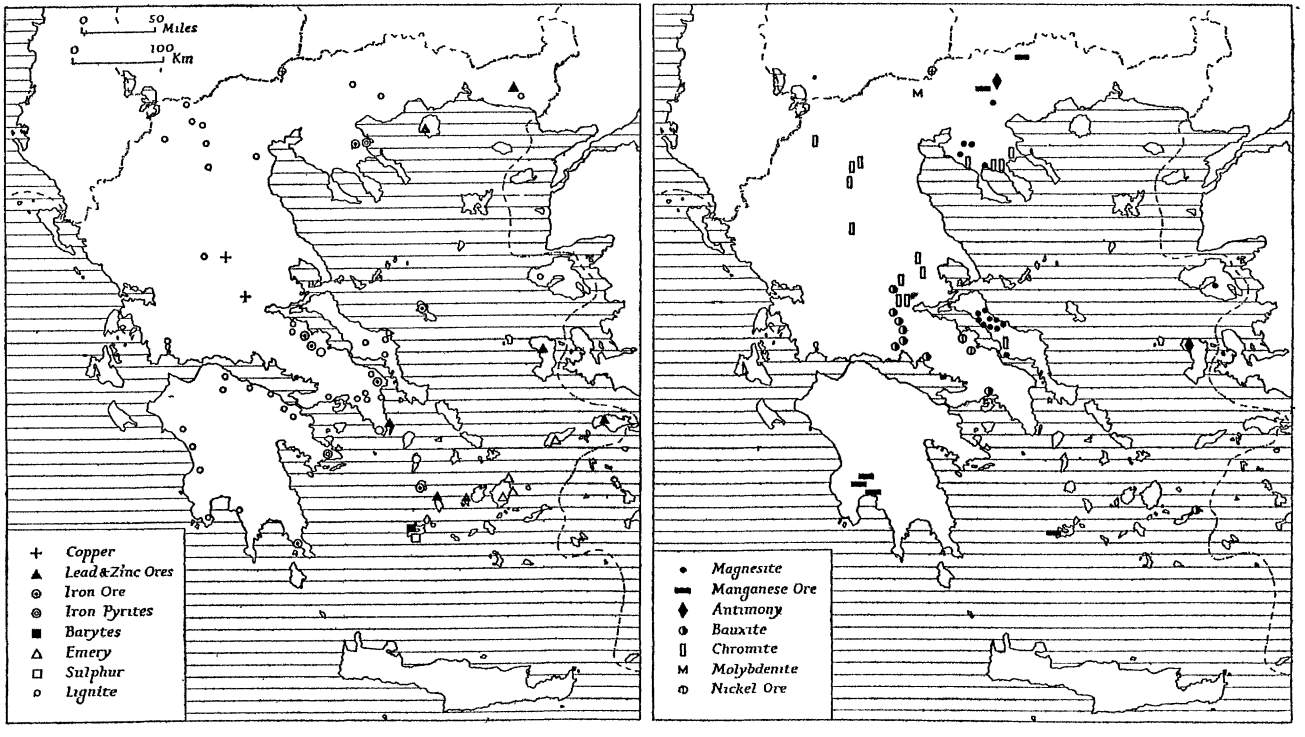


Fig. 29 The distribution of mines in Greece

Compiled from official sources
The maps show those mines which were in production in 1938, or in a few cases mines which were workable
Some of the symbols represent two or more mines where these are situated close together.

Mineral and Quarry Products in 1938

	Production*		Quantity sold	
	(tons)	(1,000 dr)	(tons)	(1,000 dr)
Iron ore	348,613	75,998	325,796	71,305
Iron pyrites	244,000	114,680	232,101	108,686
Manganese ore	7,075	9,735	1,222	1,682
Magnesite (crude)	168,243	111,377	56,264	34,842
Bauxite	179,886	59,966	150,791	45,183
Nickel ore	50,306	25,908	60,900	31,379
Chrome ore	42,464	63,696	33,603	50,552
Lead ore	14,889	24,032	—	—
Zinc ore	10,338	9,470	11,448	10,478
Barytes	34,700	14,678	—	—
Copper	4,924	2,708	—	—
Talc	1,293	2,320	1,195	2,144
Antimony	—	—	50	149
Asbestos	85	71	95	79
Marble	33,000 (cu ft)	6,071	34,000 (cu ft.)	6,426
Marble chips	12,000	180	12,000	
Santorin earth	149,729	3,893	149,729	3,688
Emery	3,078	6,589	—	—
Pumice	50,300	5,131	39,300	3,975
Gypsum	16,609	1,329	16,609	1,329
Flint	2,150	1,036	2,150	1,036
Ochre	296	183	276	170
Kaolin	216	395	216	395

* Production figures throughout the chapter are given in metric tons

phosphorus and sulphur. They occur in limestone where this rock is in contact with granitic intrusives. Other deposits of value are mined in the neighbouring island of Kíthnos, at Stratoníki on the east coast of Khalkidhikí, at Lávrion, and at Loútsi in Fókis. A French company was formed in 1939 to exploit the iron ores of western Kríti, but it was not in production up to 1940. As yet there is no iron and steel industry in Greece, and the comparatively low requirements of the country are met by imports from Germany and Great Britain.

Iron Pyrites

Greece not only satisfies her own pyrites requirements for the production of sulphuric acid, but exports considerable quantities of iron pyrites to Holland, France, Sweden and Switzerland. In 1938 some 244,000 tons were mined and over 230,000 tons were exported. By value this represents the most important of all the minerals

exported from Greece. The quality of the deposits is very high and the sulphur content is 46% at the Ermióni mine in Argolís, and 49% at Levkóvrisi near Kassándra in Khalkidhikí. These two mines are owned by the *Société Anonyme Hellénique des Produits et Engrais Chimiques*. Reserves in Argolís are said to be 1,600,000 tons and occur in shales and sandstone; those of Khalkidhikí are slightly larger and are associated with crystalline schists.

Manganese Ore

The production of manganese is small and variable, in a good year amounting to 7,000 tons, but normally fluctuating between 500 and 3,000 tons. The bulk of the ore is obtained from Lávrion, but ore of a high manganese content is found at Zerbísia in the south-western Pelopónnisos, and small deposits are also mined at Léïka near Kalámai, in the northern part of Ándros, and at Káto Nevrokópion near Dráma. The ores of Mílos form beds of from 2 to 6 ft. in Pliocene clays and are obtained from open cast workings.

Magnesite

The ore is found in veins or masses in serpentine, a highly altered igneous rock, and is mined at some ten places in Évvoia, especially in the north-west of the island, near Límni, where a belt of serpentine, 8–10 miles wide and 18 miles long, cuts east-west across beds of Cretaceous limestone. It is also found near Yerakiní and Vávdhos in Khalkidhikí and to a smaller extent at Vasilikά and Voúvari in Lésvos. The deposits are mostly worked by adit mines (Plates 32, 33).

Crude magnesite is the source from which Epsom salts and other magnesium salts are made, and magnesium in one form or another has very many applications. The deposits in Greece are amorphous, compact, fine in texture, white in colour and are noted for their purity. They are therefore suitable for the manufacture of caustic calcined magnesite, by heating to a temperature of 1,000°C.; the product is used in making quick-setting cement and for metallurgical purposes. The less pure deposits are roasted at a temperature of 1,500°C. and this dead-burned magnesite is largely used for making refractory bricks for lining basic open-hearth and electric furnaces.

The production of crude magnesite in recent years has been rising, from 92,000 tons in 1935 to 168,000 tons in 1938, representing 25% of the European total and coming second only to Austria. The

most important producer is the *Anglo-Greek Magnesite Company, Ltd.*, which was responsible for nearly 40% of the total Greek output in 1938, nearly 50% of the calcined magnesite and the total production of dead-burned magnesite. Less important producers are the *Société Financière en Grèce*, the company of *I. Lambrinidhis* with mines in Évvoia, and *P. D. Vrionis* with mines at Vávdhos in Khalkidhikí. Exports of crude magnesite, amounting to 56,264 tons in 1938, were mainly to Holland, and to a much smaller extent to Germany, Great Britain, Italy and France. In 1937 some 77,000 tons of caustic calcined magnesite and 27,000 tons of dead-burned magnesite were also exported, mainly to Germany and Holland.

Bauxite

The clay-like deposits of bauxite, hydrated oxide of aluminium, that are known to exist in Greece have a low grade aluminium content. There are proved reserves of some 15 million tons located principally along the northern shores of the Gulf of Kórinthos, in Attikí, and on the island of Amorgós; the total reserves may be as much as 50 million tons. The ores of central Greece lie along the unconformity between steeply-dipping limestones of Cretaceous and Jurassic age. The workings are open-cast and are often equipped with aerial ropeways and with power supplied by local Diesel-electric stations. Greece herself, lacking abundant and cheap electric power, has no aluminium industry and, moreover, the poor quality of the bauxite makes it more suitable for the manufacture of cement and refractories than for metallurgical purposes. Only a small quantity is retained for the home market and the bulk of the production goes to Germany, the United Kingdom and Norway. In 1934 no bauxite was exported, though there had been a small production before that year; in 1936 two mines were working, one near Itéa, the other near Dhístomon; and, in step with the increasing world demand for this mineral, there has been a rapid exploitation by several companies in recent years. In 1938 almost 180,000 tons were produced—95,000 tons by the *Société Anonyme des Mines Bauxite de Parnasse* from its workings at Kámiani and Topólia, 35,000 tons by the *Société Anonyme des Mines Bauxite de Delphe* from Ámfissa, 28,000 tons by the company of *S. Papassotiriou* from Kríkelos on Amorgós, and 22,000 tons by that of *D. Skalistiris* from Mándra near Elevsís. This production represents about 10% of the total European output, or about 4% of the world's bauxite (Plate 34).

Nickel Ore

Deposits of nickel ore are found at many places throughout Greece, usually occurring in dykes or lenses in limestone. The most important mines are in Lokrís, 11 miles to the north-west of Thivai; others are on the islands of Évvoia and Skíros. Reserves are estimated to be 500,000 tons. The ores are of rather a low grade and are not easily smelted, but the Greeks found a ready market for their production of some 50,000 tons in trading agreements with Germany and Italy. Regular shipments were made from Lárimna to Hamburg for use in the Krupp works at Essen. Greece, Finland and Norway are the leading European countries in the production of this ore

Chrome Ore

Greece and Jugoslavia are the only European countries which produce chrome ore to any appreciable extent. The deposits are widely scattered through eastern and north-eastern Greece and are of varying extent, sometimes too small to be worked. They are, moreover, of a low chrome oxide content (*c.* 40%) and are therefore more suitable for refractory than for metallurgical purposes. For the most part they occur in irregular masses 300–400 yards long and 30 yards wide, embedded in serpentine. As yet the mines are not fully exploited and the annual production figures show wide fluctuations. In 1938 about 42,000 tons of ore were mined, of which Germany acquired some 50%, although up to 1937 the United States had been the leading purchaser. By 1939 the production had increased to 57,091 tons. The principal mines are those owned by the *Société Union Minera* just south of Dhomokós in Thessalía from which a narrow-gauge railway runs to the port of Ayía Marína 8 miles away. Other exports, from mines at Tsárgli, near Fársala, are shipped from Vólos, and those from Rodhianí near Kozáni, Vávdhos in Khalkidhikí and Souflíon from Thessalonikí. The richest ores in the country, with a chrome oxide content of up to 56%, are mines near Áyios Dhimítrios in Thessalía; but production is estimated to be less than 5,000 tons. There are also small deposits in Skíros, Évvoia and other scattered localities.

Lead and Zinc Ores

Lead ores are mined chiefly in the Lávrion district of south-eastern Attikí, the largest and richest mining area in Greece. Innumerable

small workings are scattered over hundreds of square miles of country. The more important of these workings are served by a mineral railway that runs inland from the port of Lávrion (see p 275) to Kamáriza and there bifurcates south-west to Megála Pévka and north-west to Barbaliáki. The ore is found in fissures in the limestone and at the contact of the limestone with granite and gabbro intrusives: the upper layers consist largely of argentiferous galena, upon which the silver resources of ancient Athens were based; the lower layers are made up of silver-lead ores, sphalerite and calamine. To-day, the value of the silver is insignificant and production is concerned almost entirely with the lead content. The mines are worked mainly by the *Compagnie Française des Mines de Laurium*, with its principal mines in the Pláka district, 3 miles north-west of Lávrion, and at Kamáriza, 2½ miles west of Lávrion. Together, these two mines employ about 1,000 men. Production in recent years has steadily declined and in 1937 was only one-eighth of the output in 1910. In 1937 Greece produced a total of 20,181 tons of lead ore, but some of this may have come from Kírki, 10 miles north-west of Alexandroúpolis, or from the islands of Sámos and Sífnos where very small deposits (not always worked) are known to occur.

Lávrion is exceptional in that it is the only place in Greece where any smelting takes place (Plates 36, 37). The *Compagnie Française* owns a flotation plant for the concentration of lead and zinc ores, and a smelter with two blast furnaces. The smelter is stated to have an output capacity of 12,000 tons of crude lead and 2,000 tons of rolled lead, a capacity which has never been reached. In 1938, from the 16,736 tons of ore put in the furnaces, 2,896 tons of crude lead were produced, 410 tons of rolled lead, and 354 tons of litharge. Further products were red lead and white arsenic. The rolled lead is used principally in the making of lead chemicals, and to a lesser extent in the lead-shot factories at Síros.

Zinc ores are obtained from the same deposits as lead ores, and have suffered similar fluctuations in production. There is no smelter, and the whole of the output is exported, as concentrates, to western European countries.

Other Minerals

Negligible quantities of barytes, copper, talc, antimony, molybdenite and asbestos are mined throughout Greece. Of these the most important is *barytes*, which is found chiefly in the Kikládhes on Mílos, Políaigos and Kímolos: it was mined by the *S.A.*

d'Exploitation des Mines de Barytine Argentifère, usually from deposits 3–20 ft. thick. The production in 1938 was about 40,000 tons, the whole of which was exported. *Copper* is found at Stírfaka, about 8 miles north-west of Lamía, Ermióni, Lávrion, and Áyios Theódhoros just east of Kardhítsa, but in 1938 no mine was in production. *Talc* is obtained from the island of Tínos in the Kikládhes and from Khortiátis, 9 miles south-east of Thessaloníki; *antimony* from Lésvos, Khíos and Sérrai; *molybdenite* from Axioúpolis, west of Kilkís; and a very small quantity of poor quality *asbestos* from Sámos and Khortiátis.

Marble

Marble is the most important building stone of Greece; it is obtained in Attikí, in the Pelopónnisos, in Thessalía and in some of the islands. The quarries of Pendelikón are the most valuable and account for about one-third of the total output. These quarries are worked by the *Anglo-Greek Marble Company*, and they produce a fine white marble to be seen in many of the ancient and modern buildings in Athens. The same company works the green marbles of Tínos, the red marbles of the Máni peninsula, the black marbles of Árgos and Náxos, and the veined marbles of Skíros. Greek companies work the white marbles of Páros, the blue marbles of Imittós, the green marbles of Lárisa and many smaller quarries. Production seems to be declining, the average annual output of some 27,000 cu. ft., which has been maintained since 1931, being considerably less than the average figure, 65,000 cu. ft., for the previous ten years.

Santorin Earth (*Pozzolani*)

This fine quality pumice powder or volcanic ash makes excellent hydraulic cement, bricks and pottery, and is quarried in large quantities on the volcanic island of Thíra (Santoríni). It overlies lump pumice in a bed near the top of the crater, and is mined in benches and loaded directly into small boats. It was exploited by a German company and a large proportion is exported. The peak of production was reached in 1925 when 157,000 tons were quarried, since when there has been a slight diminution in output. There is one large pottery company in Greece, but for the most part the industry is local and by hand.

Emery (*Corundum*)

The island of Náxos is the oldest and one of the most important sources of emery in the world. The mineral is second only to diamond in hardness and from prehistoric times it has been used as an abrasive. The parent rock is a white crystalline limestone, and the emery, which is a black granular mixture of corundum and magnetite, is found in lenticular masses up to 100 yards in length and 50 yards in thickness. It is also found in large, loose blocks or boulders mixed with the surface soil and this form constitutes the chief source of supply. There are seventeen known deposits on the north and east side of the island, and further small deposits on the islands of Síkinos, Iráklia, Khíos, Ikaría and Sámos. The sale of emery is under government control and normally provides an important source of revenue (see p. 171). Since 1935–36, however, when there was a production of 15,000 tons, there has been a marked decline to 3,078 tons (Plate 35).

Other Quarry Products

The remaining quarry products are relatively unimportant, except for pumice and gypsum. *Pumice* is a product of the volcanic islands of Thíra and Mílos, and the output, varying from 35,000 to about 50,000 tons per annum in recent years, is exported. The production of *gypsum*, used in the making of plaster of Paris, is only some 17,000 tons, and it is quarried in Zákinthos and Kríti.

Textile Industries

The development of the Greek textile industry from small domestic handicrafts at the end of the 1914–18 war has been very rapid, and to-day, the spinning and weaving industry in general, and the cotton industry in particular, constitute the most important branch of Greek industry. This is true not only from the point of view of installations and the number of work-people employed, but also by value of production. The industry relies to a very great extent on home-produced raw materials, especially cotton and silk, and deals with all stages of the technical processes, from spinning and weaving to dyeing and finishing. In 1938 about 24,000 people were employed in the cotton and woollen industries and there were just over 300 factories. The production and value of all textiles manufactured in Greece in this year are given in the table on p. 121.

Production and Value of Textiles in 1938

Article	Production	Value in 1,000 dr.
Cotton yarn	15,750 tons	1,032,412
Cotton cloth	30,294,000 yards*	415,500
Cotton thread	20,000 (dozen)	3,500
Woollen yarn (for carpets)	220 tons	18,060
Woollen yarn (for cloth)	616 tons	136,000
Woollen cloth	7,723,000 yards*	914,111
Carpets	83,000 sq. yds.	69,800
Spun silk	250 tons	150,000
Silk cloth	3,040,300 yards*	194,600
Artificial silk	267 tons	60,075
Sacks	4,110,000	57,540
Sacking for tobacco	1,362 tons	53,104
Rope and string	2,500 tons	95,000
Knitwear	—	450,000

* The width of the cloth is unspecified.

Cotton Industry

The growth of the industry has been favoured by the existence of cheap labour, the growth of the local market and, most important of all, by the marked expansion which has taken place in the cultivation of cotton (see p. 63). Thus in the eight years from 1932 to 1940, the amount of land devoted to this crop has increased from 50,000 to 200,000 acres, and the production of unginned cotton has more than tripled to over 50,000 tons. Local consumption in domestic handicraft is small and the great bulk of the crop goes to the many textile mills throughout the country. The home-grown supplies almost meet the requirements of the mills and there has been a slight reduction in the imports of raw material in spite of the growing demand (Fig. 27). The industry provides almost 70% of the total consumption of the country and, suitably directed, it will be able not only to provide all local requirements but also to export certain classes of goods. A small export trade in yarns to neighbouring Balkan countries has already developed, and in each of the five years from 1936 to 1940 over 1,000 tons have been exported.

In 1939 there were 113 cotton spinning and weaving factories, the property of some 90 industrial concerns, for the most part limited liability companies. A large number of the factories are fitted with out-of-date machinery, the improvement of which would make the cotton industry a very real source of wealth. The largest

mills are in Athens and Piraiévs, but within recent years those at Thessaloníki have made considerable progress. Other centres of some importance are at Édhessa, Náousa, Véroia, Pátrai, Árgos, Livádhia, Lárisa, Síros and Mitilíni, and between them they controlled 316,000 spindles and 7,840 looms. Mill production had steadily increased from 10,000 tons of yarn in 1931 to over 16,000 tons in 1939, and from 25 million yards of cloth, of varying widths, to over 30 million. Recent figures on the number of operatives engaged in the industry are not available, but in 1935 there were 5,282 male-workers, 11,551 females and 1,138 apprentices. Wage levels at this time were very low, the daily wage of a male operative averaging 55 drachmae, of a female 32 drachmae and of an apprentice 16 drachmae. A ten-hour day was in force, but this was not rigorously observed. It is not easy to compare these wages with those in pre-war Britain, but making allowances for differences in the cost of living, a man's daily wage in Greece would approximate to six shillings

Woollen Industry

The manufacture of woollen goods is less important in the national economy of Greece than the cotton industry, but, like the latter, it has made considerable strides within the last decade. Thus, the output of cloth, which was less than 4 million yards in 1931, had more than doubled by 1939, meeting more than 80% of the total requirements. The development is due largely to the rigid curtailment of imports of finished fabrics from abroad, imposed by the government in May 1932 (Fig. 24). On the other hand, there was a sharp increase in raw wool and hair imports as a definite part of the Greek government's policy to stimulate the growth of the local wool-spinning industry. The 1940 requirements of raw wool were about 14,000 tons, of which some 10,000 tons were home-produced. Almost the whole of this local yarn is very coarse and scarcely fit for mechanized industry, and it is thought that Greece will continue to be dependent upon foreign supplies for a considerable portion of her high-grade woollen yarn requirements. Before the outbreak of war the industry was represented by 52 mills with about 67,500 spindles and some 1,700 looms. The chief centre was in Athens with others at Thessaloníki and Vólos.

Carpet Industry

A special impetus was given to the carpet-making industry by the arrival of refugees from Smyrna. At first individual refugees

worked on small hand looms, but later they were assisted by the co-operation of the Greek Refugee Settlement Commission, by relief societies and by banks, and what had formerly been a handicraft was transformed into a well-organized industry, with properly constituted selling organizations in western Europe and America. From 1935, however, the production of carpets has not made any progress, and in 1939 only came to one-half of the 1927 output. Technical schools have been established in the principal centres for the training of workers, and the maintenance of regular standards of colour, pattern and manufacture. Although said to be superior in quality to Turkish carpets, the Greek carpets cannot compete in price and their uniform mechanical appearance is not appreciated by foreign buyers. The carpets are hand-woven from machine-produced yarns dyed with synthetic dyes. By far the largest centres of production are two refugee villages in the Athens-Piraiévs district which are almost exclusively engaged in this industry and where there is a plentiful supply of cheap labour. The chief centres and the number of workers employed are given in the following table. Apart from these establishments there is a small home industry, and schools and homes produced a further 84,000 sq. ft. in 1938.

Carpet Production in 1938

Centre	Number of looms in active use	Number of workers	Number of employers	Production in sq ft.
Athens	178	210	15	77,578
Néa Ionía	134	172	4	42,422
Piraiévs	246	392	8	108,515
Néa Kokkiniá	326	459	25	149,376
Thessaloníki	195	352	11	63,143
Véroia	73	131	9	37,944
Édhessa	126	202	5	53,337
Other centres in Makedh and Dh Thráki	53	134	4	41,280
Other centres in Greece	401	734	18	89,322
Total	1,732	2,786	99	662,917

Silk Industry

Cocoons are extensively cultivated in Makedhonía, Dhitikí Thráki, Thessalía and the Pelopónnisos, and in 1938 amounted to 3,800 tons yielding some 270 m. tons of raw silk. In 1924 only one-tenth of the production (then about 2,600 tons of cocoons) was used in

Greece and the remainder was exported, principally to Milan and Marseilles. By 1932, however, the local production was entirely absorbed by Greek industry, as well as considerable supplies of imported cocoons. The largest mills are in Athens, where 160 tons of silk yarn and 2,320,000 yards of cloth were manufactured in 1940. The total mill production of yarn and silk cloth has remained relatively constant for the last ten years, averaging about 240 tons of yarn and 3 million yards of cloth per annum. The rearing of the silkworm is also a home industry, and a certain amount of weaving is done at home, so that it is not surprising to find agricultural labourers, especially in parts of northern Greece, wearing silk shirts of the finest quality.

There is, in addition, a rayon factory in Piraiévs which produced 318 tons in 1939 and relies for its raw materials on imported pulp. This is a comparatively new industry, beginning about 1925 with an initial output of some 20 tons per annum.

Chemical Industries

The chemical industry in Greece, favoured by numerous, but scattered local resources, by protective tariffs, and by a cheap labour supply, has made exceptional progress in recent years. The production had more than doubled in the five years from 1934 to 1938 and no other industry can show such a remarkable increase over the same period in the value of its products. But although native raw materials satisfy over three-quarters of the industrial requirements, chemical products still fall far short of domestic needs. Hydrochloric and sulphuric acids are the only chemicals produced in sufficient quantities, and Greece relies for the remainder upon Germany and, to a lesser extent, Great Britain.

There are, in all, some eighty firms classed as chemical manufacturers, but most of them are small and are engaged primarily in making medicinal or toilet articles, of which soap is the largest item. By far the greatest company, not only in Greece but throughout the Levant, is the *Société Anonyme Hellénique des Produits et Engrais Chimiques*, which is responsible for more than one-third of Greek chemical production. It was founded by Nikolas Kanelopoulos, who is sometimes referred to as the father of Greek industry. He was responsible for the first group of industries in Greece, producing fertilizers, cement, textiles, wines and spirits, pottery and building materials. The works at Dhrapetsóna, near Piraiévs, cover an area

of 84 acres and produce heavy chemicals, chemical fertilizers, glassware and bricks. The company also owns pyrites and lignite mines and employs about 2,500 people.

The following table shows the production and value of the principal chemicals and chemical products in 1938.

Chemical Production in 1938

	tons	1,000 dr
Olive kernel oil	17,000	272,000
Linseed oil	1,600	40,800
Soap	25,000	425,000
Toilet soap	600	24,000
Chemical fertilizers	95,223	359,233
Dyestuffs	338	62,622
Glass	—	185,886
Electric bulbs	1,435,000 units	28,700
Colophony	18,200	121,940
Turpentine	5,200	57,200
Explosives	1,723	59,804
Ammunition	—	395,500
Other chemical and pharmaceutical products	144,963	881,152

Heavy Chemicals

By far the most important of the heavy chemicals is sulphuric acid, which is made solely by the *S.A. Hellénique des Produits et Engrais Chimiques*. Its plant near Piraiévs has an annual capacity of 90,000 tons, and its production has increased from 15,000 tons in 1932 to over 60,000 tons in 1938. Almost the whole output of acid is used in the making of fertilizers, but it is also an important factor in metallurgical industries and in the manufacture of paints, soaps and explosives. The making of sulphuric acid is based upon local resources of pyrites which are noted for their high sulphur content (see p. 114) and, to a diminishing extent, on imports of sulphur from Sicily.

The production of other heavy chemicals is small. About 1,000 tons of carbon disulphide were produced in 1938 by the *Société Hellénique de Vins et Spiritueux* at Elevsís. This solvent is used in the treatment of olive kernels for the extraction of oil, and there are some thirty-eight factories in Greece engaged in this industry. Altogether they are capable of handling 150,000 tons of olive kernels per annum and produce, on an average, about 11,000 tons of oil.

The local supply of kernels is insufficient for the industry and is supplemented by imports from Asia Minor.

Caustic soda, which is required principally by the soap, heavy chemicals, dyestuffs and staple fibre industries, was entirely imported until 1939, but in that year a modern electrolytic plant was set up at Asprópirgos near Athens by the limited liability company, *Elektrokhemikí-Elládhos*. The plant has an annual capacity of 600 tons and uses indigenous supplies of salt. Rock salt occurs only in Árta, but is not mined since it cannot compete in price with the supply obtained by the evaporation of salt water. Salt pans are to be seen at many points along the coast, notably near the Mesolóngion lagoons and on the east coast of Levkás. The average production for the period 1931–8 was some 100,000 tons, but only about 5,000 tons per annum are used for industrial purposes.

There is no synthetic or by-product nitrogen industry in Greece, although the *S.A. Hellénique des Produits et Engrais Chimiques* has a plant at Piraiévs for the oxidation of ammonia by air. Carbide of calcium is manufactured at one factory in Greece, on the Gorgopótamos opposite Lamía. It produces about 800–900 tons per annum, representing about one-half of the country's requirements.

The explosive industry has grown enormously in the last few years, and is mainly confined to industrial explosives, producing sufficient for home consumption. In 1937 fourteen factories were engaged in the manufacture of explosives, of which the four most important were near Athens and Piraiévs. The *Société des Poudreries et Cartoucheries Helléniques* is by far the largest company, owning several groups of factories, and holding a monopoly on the manufacture of gunpowder. The main branches are the Mount Imittós factory, covering an area of 40 acres; the Dhafní factory, chiefly concerned with detonators and powder and shot for sporting uses; and, thirdly, the powder works at Vlikhá on the Athens-Elevsís road, with an area of 148 acres. Each of them produces its own electrical supply. The industry is entirely dependent upon imports for supplies of glycerine.

Paraffin wax, derived from the residues of mineral oil distillation, is produced in ten factories in Greece. The raw material (black scale wax) is imported from the United States, Poland and Great Britain, and the production comes to about 1,250 tons per annum. It is sufficient for the country's needs and is used for candle-making and in the manufacture of dynamite and other explosives.

Chemical Fertilizers

Although Greece is essentially an agricultural country the consumption of fertilizers is low by modern standards. Nevertheless the requirements are still greater than production, and there is normally a large import from Germany, Holland, Tunisia and Egypt. The manufacture of fertilizers, stimulated by a growing home market, has expanded rapidly, from 48,718 tons in 1931 to 124,019 tons in 1939. The *S.A. Hellénique des Produits et Engrais Chimiques* is the greatest producer, and is primarily concerned with superphosphates and mixed fertilizers based upon imports of phosphate rock from North Africa. It also supplies pest control products, such as colloidal sulphur, calcium arsenate, calcium sulphide, and arsenic sulphide, and a small amount of mono- and di-ammonium phosphates. This factory has played an important part in the agricultural life of the country and has obtained considerable government support. It employs agricultural statisticians and research workers on soils and crops. There are also several small factories engaged in manufacturing fertilizers from animal and fish bones, or simply in mixing ingredients imported from abroad.

Alcohol

The manufacture of alcohol from molasses was once important, but to-day it is distilled from a fixed percentage of the currant crop, or from the residue of grapes after the juice has been extracted. The government has authorized numerous stills in different parts of the country, the alcohol from which is sold at government-fixed prices to the larger wine companies for further processing. By far the largest company is the *Société Hellénique de Vins et Spiritueux*, which is responsible for half of the annual output. It is one of the oldest firms in Greece, dating back to the beginning of this century. The total production in 1939 was 17,032 tons, about one-third of which was used in the beverage industry, and the remainder in the chemical industry.

Dyestuffs

The dye industry is represented by three companies, of which the largest is the *Société de Matières Colorantes du Pirée*, with its principal plants at Néon Fáliron and Trípolis. The company produces about two-thirds of the total output of 338 tons (1938). The various groups of dyestuffs comprise aniline, naphthalene, alizarine, chromium, sulphur, and basic dyes made from raw materials largely

imported from Germany. The dyes are used almost entirely in the cotton, woollen and silk industries, and the country produces about three-quarters of its requirements.

Glass

The only glassworks of importance are owned by the *S.A. Hellénique des Produits et Engrais Chimiques* at Dhrapetsóna. In recent years they have manufactured most of the window glass in Greece. The production of electric bulbs is carried out by a subsidiary of a German concern.

Paints and Varnishes

There are some eight firms in Greece concentrating on the making of marine paints, anti-fouling compositions and boat varnishes. For the most part they utilize indigenous products, and their total annual production figures come to slightly less than 2,000 tons. Adequate supplies of gum mastic are obtained from Khíos.

Pharmaceutical Products

The pharmaceutical industry has steadily increased and has already had an appreciable effect on imports. There are few companies of importance engaged purely in manufacturing products for home consumption, but certain of the products are manufactured as side-lines, e.g. peroxide of hydrogen, medical salts and aspirin are produced by the *Société de Matières Colorantes du Pirée*, and sulphate of soda (crystals), chlorate of magnesia (in solution), chlorate of calcium (in solution) and bisulphate of soda (powder) are produced by the *S.A. Hellénique des Produits et Engrais Chimiques*.

Soap

There are some 160 soap factories in Greece, capable of producing 30,000 tons of soap per annum, and with principal centres at Athens, Piraiévs, Iráklion, Mitilíni and Thessaloníki. The industry uses local supplies of olive kernel oil, olive oil of high acidity unfit for human consumption, locally produced fats, greases, etc., but it is totally dependent on foreign supplies for its requirements of caustic soda, carbonate of soda and silicate of soda. During 1939 the production of common soaps amounted to 23,000 tons, and of toilet soaps to 600 tons. The quality is said to be excellent and there is a small export trade.

Forestry Products

The colophony and turpentine industry is one of the most important chemico-agricultural industries in Greece and is represented by some thirty factories, chiefly in Attikí-Voiotía and Évvoia. The production is almost entirely for the foreign market. Exports of colophony, the sap of pine, totalled 194 million drachmae in 1939, and turpentine accounted for a further 94 millions, an astonishing rise from 1931 when the combined export was barely worth 30 million drachmae. A by-product of the industry, tartrate of lime, was exported in 1938, but a factory for the manufacture of tartaric acid has been planned. The extraction of resin, mainly from the Aleppo pine, is an important source of turpentine. The annual resin production has been estimated at 8,000 tons, of which 5,000 are used in chemical industries and 3,000 added to wine as a preservative. Various methods of tapping are employed, differing in the form and size of the facets and the methods of catching the resin. The best yields have been obtained from shallow streaks (2 to 4 cm. deep), repeating each streak once after the first flow has ceased. Resin obtained by this streak method was found to contain 27% turpentine, compared with 17% for the chipping methods.

Another forest product is gum mastic, for which the island of Khíos is famous. It is used largely in the manufacture of lacquers, varnishes and plaster.

General Engineering Industries

The Greek engineering industry is very small, the country being almost entirely dependent upon imports, mainly from Germany. There are, for instance, no manufactures of internal combustion engines, electrical apparatus, or machine tools, precision instruments or rolling stock. What metal works exist are chiefly concerned with repairs to shipping, railway rolling stock, motor vehicles and aircraft. For example, the *Ford Company* has a small branch at Athens which carries out repairs, and two aircraft factories, one at Palaión Fáliron and the other on the road from Elevsís to Megálo Pévko, are capable of assembling and repairing. There are also some factories, notably in the Athens-Piraiévs district, engaged in the manufacture of agricultural implements and small metal articles. Although still in its infancy, and handicapped by competition from imported goods as a result of clearing agreements with Germany, the making of small

articles has developed more rapidly than any other industry. In the ten years from 1928 to 1938 output has been increased almost six-fold. Primarily this growth is due to the abundant and cheap labour supply in the capital and its port.

In 1938 a *National Iron and Steel Company* was formed and in the following year a factory was completed between Athens and Piraiévs for the production of iron and steel sheets and tinplate. It was equipped with Siemens-Martin furnaces. In the same year a rolling-mill plant for iron and tinplate was erected. As yet, however, all requirements have to be imported. A certain quantity of scrap-iron is made available annually from shipbreaking, but it is exported mostly to Italy, Roumania and Jugoslavia.

Agricultural Implements

The size of the Greek farm is small, and in most cases no agricultural implements other than ploughs and harrows are required for cultivation. Partly as a result of this small local market and partly because of the lack of engineering tradition, capital and raw materials, there are only a few Greek factories engaged in making farm machinery. These are mostly ploughs, harrows, ginning and sowing machines, and hay compressors. The repair of large threshing machines and tractors, which for the most part are of British manufacture, can also be undertaken. But while there are few factories, handicraft is very well developed in Greece and there are always several blacksmiths in each farming community able to make plain iron ploughs, usually with spare parts obtained from factories at Piraiévs, Thessaloníki or Vólos.

Other Metal Products

Greece produces a small quantity of metalware for the home market and could greatly increase the industry. But, owing to clearing conventions with various countriés, especially Germany, large quantities of manufactured articles were imported from 1936 onwards, to the detriment of the home industries. Articles thus affected are of various kinds such as metal tubes, cables, nails and screws, electrical apparatus, and aluminium utensils (see table on p. 131).

Shipbuilding and Marine Engineering Industries

Ocean-going steamships cannot be built in Greece, and since the mercantile marine consists chiefly of this type of vessel, the requirements of shipowners have been met by purchases in foreign countries,

Production of Metal Articles in 1938

Article	Production	Value (1,000 dr.)	Article	Production	Value (1,000 dr.)
Nails, tacks, etc	6,100 tons	54,900	Scales	1,100	2,400
Screws	320 tons	9,040	Safes	180	810
Bedsteads (metal)	70,000	38,500	Locks	173,000	3,542
Ploughs	15	6,000	Electric batteries	7,600	6,840
Plough-shares	250	6,250	Radiators	800 tons	16,000
Copper & bronze products	1,560 tons	89,500	Stoves	12,000	6,600
Iron wire	5,000 tons	45,000	Aluminium utensils	161 tons	26,950
Iron pipes	2,844 tons	45,504	Enamel utensils	331 tons	20,000
Copper pipes	500 tons	8,250			

chiefly Great Britain. The only shipyard capable of building steel ships was that of the *S.A. Ateliers et Chantiers Helléniques Vassiliadhes*, with one building slipway, at Piraiévs. The largest vessel built here is 1,000 tons and 300 feet in length. No naval construction is undertaken in the country. Several yards are capable of constructing wooden vessels, chiefly caiques up to 50 tons used in the coastal trade, or fishing boats. Wooden vessels were formerly built in many ports, but with the depletion of local supplies of timber, especially in the islands of the Aegean, this industry has now become more strictly localized and is based in some instances on imported timber. The most important centres are Síros, Préveza, Vólos, Thessaloníki, Alexandroúpolis, Khalkís, Kaválla and Lávrion.

The marine engineering industry is equally restricted in scope. Simple boilers are made by twelve firms at Piraiévs, and nine of them build other types of marine machinery; there were also two firms at Síros and one at Thessaloníki. No internal combustion engines are manufactured, however, and the petrol engines with which many Greek sailing craft are equipped have been imported.

The ship-repairing industry is of greater importance and reveals the dominance of Piraiévs in shipping. Many of the firms are owned by shipping companies and can carry out major repairs both to merchant and to naval ships of up to 8,000 tons, and to engines and boilers. Repairs to electrical equipment are also undertaken. There are two dry docks at Piraiévs with lengths of 479 feet and 336 feet respectively, and a patent slipway with a length of 612 feet and a lifting capacity of 2,000 tons (see p. 232). The slipway is situated in the *Vassiliadhes* shipyard. The port of Síros has a patent slipway

601 feet long which can accommodate vessels of 1,000 tons displacement; repairs to hulls and machinery are made. All types of repairs and maintenance necessary for the small Greek navy are carried out at the principal naval dockyard of Salamís, which has one floating dock with a lifting capacity of 1,400 tons and another of 3,000 tons displacement. There are workshops for the repair of hulls and machinery of destroyers and submarines, foundries, machine shops and electrical shops where motors and generators can be repaired, besides boiler shops. There are facilities for repairs of all types at the naval bases of Skaramangá, which has a patent slip accommodating one vessel of 1,800 tons or two of 1,000 tons, and Amfípolis, which has workshops, foundries, machine shops and welding equipment. In addition there are several yards which make minor repairs to wooden fishing and coastal craft, chiefly of the caique type.

Food and Drink Industries

The food and drink industries once held a pre-eminent position in Greece, and in 1930 at the time of the last industrial census, one quarter of all manufacturing establishments were engaged in the preparation of food and drink. These factories employed 46,157 people, or 16·5% of the industrial workers. Since that year the position of the industry has declined relatively, and although the value of production has increased by some 740 million drachmae from 1934 to 1938, it is now surpassed by both the textile and the chemical industries.

The standard of manufactured foodstuffs varies considerably and few products carry brands or trade marks. Most factories are naturally concentrated in the principal towns, such as Piraiévs, Thessaloníki, Pátrai, Vólos and Kalámai, where there are ready markets and storage facilities for imported foodstuffs. In recent years there has been a development of the preserving industry, especially at Árgos, Návplion and Vólos, with establishments for tomato purée, tinned vegetables and preserved fruits, and also on the north coast of Évvoia, where sardines and other fish are canned. The main items of imported manufactured food are sugar, condensed milk and potato flour.

Flour Milling

Greece is not self-supporting in wheat, her annual production averaging some 750,000 tons and her imports amounting nearly to

500,000 tons. The largest and most numerous flour mills are therefore at the principal ports—Piraiévs, Thessaloníki and Khaniá. In all, there are some 170 important flour mills in the country and about 7,000 smaller ones in rural districts. The five years from 1933 to 1937 showed a progressive increase in the milling costs of wheat.

Olive Oil

The total production of olive-oil averages about 110,000 tons, of which some 10 % is exported. The oil provides by far the chief source of fats in the Greek diet and the mean yearly consumption per head is 26 pints (33 lb). There has been a marked increase in production within recent years, largely due to improved methods of extraction by specialized producers, but most of the oil is still produced by individual growers, and by the simplest methods, in the olive-growing areas. The output of olive-oil by *nomoí* is shown in Fig. 19.

Confectionery

The manufacture of biscuits, chocolates and sweets was valued at 359 million drachmae in 1937, an increase of more than 100 millions over the figure for 1933 Greece is noted for its production of *loukoúmi*, called Turkish delight, and for *halvá*, a mixture of honey and sesame seed Most of the *loukoúmi* factories are in Piriaévs and Thessaloníki; the island of Síros, which produces the best, has nine. Some of the raw materials for the confectionery industry, such as honey and sesame seed, are home-produced, but a large proportion, including sugar, flour and cocoa-beans, is imported.

Wines and Spirits

Peasants and small proprietors produce their own wine, but it is also manufactured commercially. The industrial production of wine has developed considerably and there are some 200 establishments, the most important belonging to the *Société Hellénique de Vins et Spiritueux.* In conjunction with wine, the majority also make alcohol, both potable and for technical and illuminating purposes (see p. 127).

Greek wine is not very highly esteemed in western European countries, but some table wines such as Demestika, Tour la reine, Tegea and dessert wines like Samos or Mavrodaphne are of fair quality. A favourite liqueur in Athens is *mastikha*, made with the

gum of the resinous lentisc or mastic plant, for which Khíos is particularly famous; brandies are sweet and insipid. The value of these manufactured alcoholic drinks amounted in 1939 to 31 million drachmae, and there is a large export, especially to France and Belgium. Rather more than half of the total Greek brandy export goes to Egypt.

There are breweries at Athens and Pátrai, and in Makedhonía at Thessaloníki and Náousa, held by the firm of Charles Fix, *Société Anonyme des Brasseries*, which has a monopoly throughout Greece. Greek beer is light and good, but is more expensive than wine. The amount produced in 1939 was valued at 125 million drachmae as compared with 64 millions in 1931.

Tanning and Leather Industries

Greece exports over 5,000 tons of sheep and goat skins for which the principal market is Germany, but, on the other hand, the country is deficient in heavy hides and the average import of cattle and calf skins amounts to 3,500 tons. The manufacture of leather is not an important industry and has declined in recent years. Normally there is a production from cattle and calf hides of some 5,000 tons, of which 2,000 tons result from the slaughtering of animals reared in Greece and the balance from imported hides. The tanning materials necessary for the industry are partly obtained from the Valona oak (*Quercus Aegilops*) which forms extensive open forests in Dhitikí Thráki, on the lower mountainous slopes of western Greece, in the north-western Pelopónnisos and on the islands of Lésvos and Kéa. The products from these trees are supplemented by the import of tanning extracts from the Valona oaks of Turkey and from the *quebracho* of Argentina.

Almost the whole of the leather production is used in Greece, principally in the boot and shoe industry. Estimates gave the production of leather footwear in 1936 as 5,250,000 pairs, for the most part made in the fifteen shoe factories located in Athens, Piraiévs, Thessaloníki and Pátrai. Less than half of these factories were mechanized. The remainder of the footwear was made by hand in numerous small local shops, scattered throughout the country. Production figures for 1938 were:

Sole leather	5,800 tons	464,000,000 dr
Leather for uppers	2,250 tons	506,250,000 dr.
Machine-made shoes	—	30,000,000 dr.
Gloves	160,000 pairs	—

Building Industry

The building industry received a tremendous impetus after 1922, largely owing to the acute housing problem created by the incoming of Greek refugees from Turkey. In the last decade, however, the industry has remained at a fairly constant level of production. By far the most valuable product, as shown in the following table for 1938, is cement:

	Production	Value (1,000 dr)
Cement	308,000 tons	301,840
Bricks	135,000,000	54,000
Roof tiles	21,500,000	21,500
Mosaic plaques	658,000 sq yds	41,250
Lime	315,000 tons	88,200

There are four cement companies, owning between them six factories with a potential capacity of 400,000 tons, but with an output equalling demand of 300,000 tons Production has doubled since 1931, while exports have fallen from 42,000 tons to less than 1,000 tons. The chief company, which is responsible for nearly half the total output of Greece, is the *Société Générale Ciments*, with works at Dhrapetsóna and Vólos. The *Titan Cement Company* has perhaps the largest individual plant, located at Elevsís; the *Société Anonyme des Ciments de Chalkis Artificials* has works at Khalkís and elsewhere in Évvoia; and *Atlas Company, Ltd*, has two small plants at Skaramangá and Athens respectively. Apart from imports of coal, required for the intense heating of lime with clay, Greece is self-sufficient in the necessary raw materials. Limestone is the most widely found rock in the country, and much of the bauxite mined in Greece is more suitable for making high quality cement than for its aluminium content. Santorin earth (see p. 119) is itself a natural cement. Caustic calcined magnesite, mainly produced by the *Anglo-Greek Magnesite Company, Ltd.*, is also used in the making of quick-setting cement. Moreover, the lignite deposits are being increasingly used as a source of fuel for the factories in Évvoia. As yet the cement is used almost entirely in the building industry (Plate 38), but it is probable that its use as a road-building material will assure the prosperity of the industry in future years.

Bricks and tiles are made by some 80 manufacturers, apart from very small producers who probably make sun-dried bricks. The

Atlas Company, said to be the biggest building materials firm in the Balkans, has large works in Athens, and there are other important factories in Khios, Piraiévs, Thessaloníki, Vólos and Zákinthos.

Timber and Wood Products

The forests of Greece are not extensive and for the most part are poor in commercial quality. Thus, although the country is practically self-supporting in firewood and charcoal the annual production of constructional timber is insufficient to cover domestic requirements, especially for industrial purposes. Some 13 million cu. ft. of industrial timber are imported yearly to help to meet a total consumption of 17 million cu. ft. These imports consist largely of coniferous woods—sawn and planed goods for general constructional purposes from other Balkan countries and Scandinavia.

The annual production of constructional timber is little more than 3·5 million cu. ft., rather more coming from the privately-owned than from the state-owned forests. These low production figures are partly the result of inattention to forestry development and improvement, and partly due to the mountainous nature of the country and the lack of forest roads which make exploitation difficult. In 1939 two modern steam-driven saw-mills owned by the University of Thessaloníki, in the Píndhos mountains and in the hinterland of Thessaloníki, had an annual capacity of 175,000 and 212,000 cu. ft. respectively. A modern impregnating plant for sleepers had also been erected at the Katerini railway station. Three other saw-mills were reported to be under construction—near Kastaniá-Áspro in the Píndhos mountains of Thessalía, in the Grevená district of western Makedhonía, and in the fir forest of Arkadhía in the Pelopónnisos.

The principal paper mills are in Athens, Aíyion, Kérkira, Piraiévs, Thessaloníki and Pátrai, which produced among them 21,000 tons of paper and cardboard in 1938, valued at 307 million drachmae, and cartons to a value of 120 million drachmae The pulp is largely imported from Germany.

Tobacco Manufactures

Tobacco is the most lucrative of the cash crops grown in Greece, and before the outbreak of war Greece was the most important tobacco-producing country in Europe. The annual production is

about 60,000 tons, of which just less than 6,000 tons are used locally in the making of cigarettes. Very few cigars are made and no fully prepared pipe tobacco is exported. There is a growing demand abroad for the attractively boxed Macedonian cigarettes, made from the best Xánthi and Kaválla tobacco. When the output was small cigarette-making was a hand industry, but with the growth of the foreign market new factories were built, fitted with machinery supplied by Britain. The principal manufacturing centres, apart from Athens, were in the chief ports—Piraiévs, Thessaloníki, Pátrai, Vólos, Kalámai, Pírgos, Mitilíni and Zákinthos. In 1938 the value of tobacco alone in exported cigarettes came almost to 13 million drachmae, but apart from this, there was the cost of the boxes and a very heavy tax. The cigarette industry is mainly under the control of *Papastratos Brothers* (Plate 39), and, to a lesser extent, the Pírgos company of *Karavassili.* Cigarette paper is a government monopoly.

Rubber Manufactures

The rubber industry is small and completely dependent upon imported raw materials, the normal consumption amounting to less than 1,000 tons of raw rubber per annum. There are about twelve concerns, located in Athens, Piraiévs and Thessaloníki and employing 1,500 workers. The largest company is the *Ethel National Rubber Industry,* chiefly concerned with the production of rubber footwear, but also covering a fairly wide range of other articles, in small quantities and of varying quality. Imports of rubber goods vary between 1,000 and 1,500 tons and consist almost entirely of tyres and tubes from Italy and the U.S.A.

Fuel and Power

The fuel resources of Greece are limited to a few outcrops of lignite and to some traces of mineral oils, as yet inadequately surveyed. The lack of fuel, the undeveloped nature of the water-power resources and the growth of industries have led to steady increasing imports of coal, coke and petroleum products. Before the outbreak of war the chief motive power used in industry was gasoline, accounting for 63 % of the whole, and all of which was imported. Electricity supplied a further 29 %, the use of steam and water power being insignificant.

Lignite

The production of lignite has varied in recent years from about 100,000 to 150,000 tons per annum, produced from some twenty odd mines (Fig. 29). The quality is rather better than that of German brown coal, but its heating power is stated to be relatively low. The bulk of the consumption is by the glass and chemical industries at Piraiévs, railways, cement works and various minor establishments throughout the country, and the consumption is entirely local. The principal mines are near Kími in Évvoia and at Mavrosouvála near Oropós in Attikí, with less important occurrences in Makedhonía and the Pelopónnisos. The Kími mines normally produce about 80 tons daily and employ some 300 workers, the lignite being conveyed to the sea by aerial ropeway. An increased production of lignite would contribute materially to the solution of the fuel problem in Greece, but even with encouragement from successive governments the production level remains well below that of 1918 when it reached 218,000 tons This is largely the result of inadequate transport facilities, unskilled miners and the lack of mining engineers.

Coal and Coke Imports

The imports of coal in 1938 reached the peak figure of 897,000 tons, over 70% coming from Germany, with Britain and the U.S.S.R. filling the second and third places. Minor supplies were drawn from Turkey, Poland and Bulgaria. These modest requirements reflect the lack of heavy industry and the absence of domestic heating throughout Greece. From 1926 the supply of coal and coke to Greece has been a matter of keen competition between Britain, Germany and the U.S.S.R. The quality of Russian coal is considerably inferior, although cheaper, and is used mainly for bunkering some of the Greek vessels engaged in the coastal trade German exports rose rapidly after 1935 as the result of a favourable Graeco-German clearing agreement and in 1938 that country supplied the bulk of the coke import of 70,000 tons. Supplies from Britain, on the other hand, fell to 5%.

Estimates of the consumption of coal in Greece per annum are: railways—150,000 tons; shipping—150,000 tons; electric power stations—125,000 tons; domestic uses—100,000 tons; cement works —75,000 tons; other industries—250,000 tons. Some coal is imported for the gas and coke industry, but the total production is small,

amounting in 1937 to 460 million cu. ft. of gas and 20,760 tons of coke. The gas is used to a limited extent for cooking and heating, and the only companies in operation before 1941 were in Athens, Piraiévs, Pátrai, Thessaloníki and Vólos.

Petroleum

Oil seepages and outcrops of bituminous beds occur at various places throughout Greece and the future discovery of petroleum resources of local importance is possible. At the end of 1938 a five-year exploration concession was granted to Greek-American interests (W. G. Helis). The concession covers almost the whole country, except for part of north-western Greece where numerous seepages of oil and bitumen occur in Miocene rocks, probably representing a continuation of the southern Albanian oil belt. The exploration of this area is held by the *Western Greece Oil and Asphalt Company*. Other seepages are in the Pliocene beds of southern Zákinthos, in Miocene strata near Killíni in the western Pelopónnisos, and on the volcanic island of Áyios Evstrátios in the Aegean sea. The natural spring at Kerí in south Zákinthos yields three barrels of bitumen a day, which is used locally as mortar and for caulking ships.

The normal consumption of petroleum products in Greece is about 350,000 tons per annum, a large part of which is accounted for by industry. Gasoline consumption amounted to no more than 65,000 tons in 1938; other requirements included 20,000 tons of kerosine for domestic heating and lighting, 24,000 tons of fuel oil, and 9,000 tons of lubricating oils. Roumania supplies all the kerosine and almost all the gasoline, while the United States provide the bulk of the lubricating oils, and Curaçao 30% of the Diesel and fuel oil There is no refining capacity in the country and imports are therefore in the form of products ready for consumption.

Electric Power

The development of electrical supplies in Greece has not been rapid, despite the poverty of the country in natural fuels and the abundance of potential water power. Consumption has increased at an annual rate of 10% to approximately 260 million kWh. in 1939, but it is significant that consumption per head of population is only one-tenth of that for the United Kingdom. Slightly less than one-half of this output is used for public supplies. As yet there is no national transmission network, nor even any connexion between

stations serving adjoining areas. In 1939 there were over 400 places in Greece which had a small local generating plant, usually fitted with a Diesel engine; most of them were of less than 100 h.p. Over 90% of the electrical output is generated in thermal stations and the only large station making use of hydraulic power is that of Véroia in Makedhonía, although there are smaller ones at Pátrai, Édhessa, Náousa, Gorgopótamos and Pílos. The most important of the thermal stations are two in the Athens-Piraiévs district which have a combined capacity of 75,000 kW. (Plates 40, 41), and lesser ones at Kalámai, Lárisa, Návplion, Pátrai, Thessaloníki and Vólos. It is estimated that two-thirds of the total electricity production in Greece is supplied by the *Electric Light Company of Athens and Piraiévs*. In 1939 the supplies from this company amounted to over 200 million kWh., about half of which was used in the many industrial plants of the capital and its port.

Conditions since 1941

Many of the minerals mined in Greece are of value to German industry and the exploitation of chrome ore and nickel ore, bauxite and lead and zinc ores has continued at pre-war levels. On the other hand, it is stated that the mining of magnesite, iron ore, pyrites, emery, barytes, and gypsum has been abandoned.

Industrial activity, except perhaps for cement-making, has declined catastrophically, largely because so many of the small scale industrial establishments are dependent upon imported fuel to drive their thermal and Diesel power engines. Supplies of coal and coke from Germany are less than one-fifth of the normal pre-war requirements, and are barely sufficient to maintain communications, public services, and those industries in which the Germans are interested. Supplies of petroleum are limited to imports from Roumania and are thought to be less than one-tenth of 1939 figures.

The textile industry has been crippled by the diminishing yields of raw cotton and the export of part of the crop to Germany. Farmers were also obliged in 1942 to deliver the whole of their cocoon production to the Italians with a consequent decline in the silk industry. The weaving mills, however, have been partly maintained and have produced strictly limited amounts of standard cloth for home use, as well as meeting some German requirements for woollen cloth. Lack of coal virtually stopped the production of cement in 1941, but subsequently there was considerable activity to meet the needs for

building fortifications. Other industries, except for the manufacture of explosives, glycerine, turpentine, and the maintenance of repair plant for aircraft, have either ceased or been very much reduced in scale.

Bibliographical Note

1. There is no complete account of Greek mines and industries published in English, and for much of the recent information in this chapter official sources have been used The growth of manufactures from 1923 can, however, be traced in the many reports published by the Department of Overseas Trade These are

(*a*) *Report on the Industrial and Economic Situation in Greece, July* 1923 (H M.S O , London, 1923)

(*b*) *Report on the Industrial and Economic Situation in Greece for the years* 1923 *and* 1924 (H M S.O , London, 1925).

(*c*) *Report on the Industrial and Economic Situation in Greece, May* 1927 (H M S O , London, 1927)

(*d*) *Report on Economic Conditions in Greece, May* 1928 (H M.S O , London, 1928).

(*e*) *Economic Conditions in Greece,* 1932–33 (H M.S O , London, 1934).

(*f*) *Report on Economic and Commercial Conditions in Greece, April* 1937 (H M S O , London, 1937)

(*g*) *Report on Economic and Commercial Conditions in Greece, July* 1938 (H M.S O , London, 1938)

2. Official statistics are issued by several departments of the Greek government· they do not always agree The most convenient summaries of production figures are to be found in the *Annuaire statistique de la Grèce* (Athènes, annually) and in the *Bulletin mensuel du commerce special de la Grèce avec les pays étrangers* (Athènes, monthly). There have also been two official censuses of Greek industry

(*a*) *Recensement des entreprises industrielles de* 1920 (Athènes).

(*b*) *Recensement des établissements des entreprises industrielles et commerciales de l'année* 1930 (Athènes)

The location of industrial establishments in Greece can be found in directories of the principal towns and cities, but few of these are up-to-date The most comprehensive is the *Guide Commercial et Industriel de la Grèce,* 1935 (Athènes).

3 Short surveys of industrial development are given in E G. Mears, *Greece To-day* (Stanford University Press, California, 1929) and in *The Near East Year Book,* 1931–32, edited by H. T Montague Bell (London, 1931), but both have lost much of their value owing to the rapidly changing conditions More authoritative reviews are given by (1) G. Charitakis, 'Le mouvement industriel en Grèce pendant les années 1915–25', pp 223–43 of *Les Effets Économiques et Sociaux de la Guerre en Grèce,* edited by André Andréadès This forms the Greek section of *Histoire Économique et Sociale de la Guerre Mondiale* (Publ de la Dotation Carnegie pour la Paix Internat , Section d'écon. et d'hist , Paris and New Haven, 1928) (2) *The Balkan States,* vol. I, 'Economic', *A Review of the Economic and Financial Development of Albania, Bulgaria, Greece, Roumania, and Yugoslavia since* 1919 (London, 1936), which was prepared for the Information Department of the Royal Institute of International Affairs.

Chapter V

COMMERCE

General Economic Situation. Commercial Policy. Volume of Trade Import Trade Export Trade: Foreign Trade by Countries. Bibliographical Note

General Economic Situation

The twentieth century has seen a considerable measure of economic progress in Greece. Before the year 1900 there were only a few industrial enterprises and they had a rather precarious existence At the same time, Greek agriculture was much behind that of most western European countries—cultivation was impeded by the continued use of most primitive implements, and pastoral farming was still subject to grave disadvantages (see p. 49). The years between 1900 and 1911 saw little fundamental change in the economic structure of Greece, but here and there signs appeared which indicated the possibility of future economic development. Greek engineers and chemists were studying abroad in increasing numbers, particularly in Germany; and, on returning to the homeland, they naturally began to use their technical knowledge to commence small industries, to open and extend mine workings, to construct new roads and bridges, and to improve agricultural technique. A landmark in this period was provided by the foundation of the co-operative movement in 1910, and the subsequent rapid spread of its influence (see p. 184)

The Balkan wars, 1912–13, created a growing awareness of the need for a sound national economy; it was realized that imports could not continue to be financed by piling up a huge international debt. In consequence, state assistance designed to improve rural life and increase agricultural production was provided by three laws of 1914 which dealt with the status of co-operative societies, with land reform and with the provision of agricultural credit (see pp 182–91).

The European war of 1914–18 resulted in a severe curtailment of manufactured products imported into Greece, so that scarcity of goods, high prices and the national needs, all combined to provide a powerful and compelling incentive for Greek industrialists to establish their own manufacturing plants. Progress was impeded

for some years because of difficulties in obtaining machinery, raw materials and skilled labour during the turbulent conditions engendered first by the European War, 1914–18, and then by the war with Turkey, 1920–2. But plans for the development of Greek industry had been laid They were to be developed with the aid of cheap, skilled, refugee labour in the 1920's, and industry was to grow rapidly in the 1930's (see p. 105).

Meanwhile, as a result of the combined cost of wars, rehabilitation and refugee settlement, Greece was in serious financial straits (see p. 165). Gradually, however, between 1922 and 1929 living conditions improved as currency inflation subsided Food became cheaper as agricultural production increased owing to the further widespread land reform measures of 1922–6, the successful absorption of the refugees and the continued spread of the co-operative movement. This progress towards a more settled economy seemed to be confirmed by the currency stabilization and the financial reorganization which took place in 1928 (see p. 165). Greater confidence among foreign capitalists in the security of their Greek industrial holdings combined with a boom period in world trade in 1928 to create further expansion and optimism, while under the new Agricultural Bank (see p. 182) agrarian advance seemed assured. Even so, an examination of the accounts of the Greek balance of payments as calculated by the Bank of Greece suggests that in these years Greece continued to depend upon foreign borrowing for the maintenance of a standard of living which under no circumstances could be considered as a high one. This borrowing continued uninterruptedly up to 1931. By that time an additional annual foreign debt charge of some 340 million stabilized drachmae—about one-sixth of the total foreign debt service—as well as a very large internal debt, had been incurred by Greece since the stabilization loan of 1928.

The continued effect of a normally unfavourable trade balance, the catastrophic fall in the prices of the main Greek export products (a kilogramme of tobacco commanded only one-quarter of the price in 1933 that it did in 1929), the decline in emigrants' remittances and in income from shipping activities, and the fact that the inflow of foreign capital suddenly dried up at the end of 1931—all combined to make a partial debt default unavoidable. In 1932, therefore, Greece found herself unable to make payments on the greater part of her foreign debt. Vain efforts were made during the seven months from October 1931 to April 1932, both to restrict imports indirectly by means of the system of exchange control then in force, and also

to maintain the stabilization parity of her currency (see p. 166). Ultimately, however, Greece was driven off that parity. After that event, her trade accounts were brought nearer to a balance by a radical cut of imports, achieved by a system of direct import restrictions, and by an all-round rise in tariffs (see p. 145).

Behind this tariff protection, Greek industry began to prosper and develop (see p. 105). The economic policy followed by Metaxas after the establishment of his régime in 1936 served to strengthen the former trends towards economic nationalism. The abolition of all peasant debts (see p. 186) was a boon to agriculture, and, although strict trade control undoubtedly led to a higher cost of living, it continued to be of advantage to the home industries. Despite systematic efforts to make the country more self-sufficient by adding to the area of cultivated land (see p. 53) and by stimulating industrial activity, both the export and import trades increased each year from 1934–8.

The increase was largely due to the German trade drive in south-eastern Europe which was directed to achieve a large volume of imports for the developing Nazi war economy. However, by 1938 Greece was probably in a much stronger economic position than she had been at any time in her modern history. Her budget was not conspicuously unbalanced, her industries were well established, and her agriculture was prospering. Nevertheless, there were still two fundamental weaknesses in the national economy. The first was the over-dependence of Greece on Germany both as a market for her exports, and as a supplier of many of her essential industrial raw materials, machine tools, and the products of heavy industry. The second was her continued need to import cereals from Balkan and overseas countries.

Commercial Policy

The foreign trade of Greece has been subject to many kinds and degrees of official control since 1931. In that year all dealings in foreign exchange were concentrated in the Bank of Greece, and since then exchange control has been more efficiently and rigorously enforced than in any other Balkan country. To reduce dealings in foreign exchange to a minimum, Greece instituted clearing agreements with a number of countries, the most important of which were Germany, France, Czechoslovakia, Hungary, Italy and Switzerland, while trade with most of the Balkan countries was covered by partial clearing agreements. One result of this policy was the direction of

trade into definite channels detrimental to those nations which did not possess clearing agreements, and in particular to Great Britain, who by 1938 had lost to German competition much of her Greek markets for iron and steel goods, coal and chemicals, and was also being ousted from her position as the leading supplier of woollen goods. By means of these clearing agreements, Greek imports came to be derived mainly from those countries that purchased most from her. Germany, by offering attractive prices, often considerably above the competitive level, greatly increased its imports from Greece. The dangers of such a situation were considerable; Germany might at any time use its strong position to force Greece to comply with any request it might make, and, though this danger was realized by the Greek government, little was done to divert trade to free-exchange countries. Indeed little could be done while the demand of those countries for Greek products was relatively low.

The exchange clearing agreements were reinforced by import restrictions which, first appearing in 1932, later grew to cover almost every commodity, so that by 1938 practically all imports were covered by prohibitions, licences and quotas. These restrictions were applied with a threefold purpose: firstly, to limit the total volume of imports, and thus reduce the Greek adverse balance of trade; secondly, to afford some protection to local industries; and, thirdly, and most important of all, to direct as much export trade as possible in the direction of certain countries, particularly Germany. This last aim was an attempt to exhaust the credits of Reichmarks which Greece was finding extremely difficult to liquidate by ordinary business intercourse.

In 1938, imports were divided into nine categories with varying degrees of control for each, some goods being almost unrestricted, while others were altogether prohibited. Coal and fertilizers could be freely imported from anywhere, and other products such as wheat, timber and certain kinds of machinery only required an import permit which in most cases was freely given. Iron and steel goods, on the other hand, could only be imported from 'clearing' countries. Other devices to restrict the flow of imports included quotas apportioned to different countries and assessed on the quantity of goods to be imported, as in the case of textiles, or on the value of the commodity, as in the case of motor vehicles.

The first claim on any foreign money available for import purchases was allocated to those essential imports for which payment in free-exchange was imperative. This meant that, even when there

was no stipulation as to the countries from which other less essential imports might be drawn, they tended in fact to come from countries with clearing agreements. The power to distribute free-exchange to imports from non-clearing countries was vested in a special committee, which could, if necessary, grant import permits above quota allotments. Quotas themselves were distributed by the various Chambers of Commerce to individual importers, usually on the basis of their imports for the period 1930–2. A certain amount of free-exchange was required even for imports from clearing countries, and in some agreements a definite percentage was stated which had to be paid for in free-exchange, as, for example, in the case of the agreements with Jugoslavia and Roumania.

It is difficult to assess whether or not Greece was better off on balance as a result of all these complicated restrictions; but it would appear that in some degree the increased trade with Germany did increase the national income of the country.

Volume of Trade

The foreign trade of Greece resembles that of the other countries of the Balkan Peninsula, but there is one important characteristic which immediately distinguishes it. All the other countries of south-eastern Europe, except for Albania, regularly export large quantities of agricultural products, particularly of wheat, maize and livestock. Greece, however, despite the fact that two-thirds of the cultivated area is devoted to the production of cereals (Fig. 13), has to import a large proportion of her requirements of these commodities to make good the deficiency in her own production. About half a million tons of cereals are imported annually, a figure which is occasionally exceeded when the Greek harvest has been a poor one. Greek exports, indeed, are largely made up of agricultural products—currants, tobacco, wine—but these are not essential foodstuffs and the demand for them falls considerably during world trade depressions, with a consequent severe reduction in the Greek national income

Balance of Trade

In 1937, the total value of Greek imports was 15,204,363,000 dr., while the value of exports stood at 9,555,293,000 dr., thus showing a visible adverse balance of trade amounting to 5,649,070,000 dr. The foreign trade of Greece between the years 1929–37 is shown in the following table:

Value in thousand millions of drachmae

Year	Imports	Exports	Excess of imports over exports
1929	13 3	7 0	6 3
1930	10 5	6 0	4 5
1931	8 8	4·2	4 6
1932	7 9	4 8	3 1
1933	8 4	5·1	3 3
1934	8 8	5·5	3 3
1935	10 7	7·1	3 6
1936	11 8	7 4	4 4
1937	15 2	9 6	5 6

Source. *Annuaire statistique de la Grèce*, 1938, p 147 (Athènes, 1939)

Both the yearly adverse balance of trade and the severe reduction of imports and exports during the depression years from 1929–33 are clearly apparent.

After 1932, Greek government policy was directed to achieve a better balance of trade by reducing imports and increasing exports, and considerable progress was made to this end. Nevertheless, the Greek visible adverse balance of trade continued to increase, and rose from 3,290 million dr. in 1933 to 4,437 million in 1936, and again to 5,649 million in 1937, adequately illustrating the continued dependence of the Greek economy—even in a period of pronounced economic nationalism—upon a high volume of foreign trade.

Balance of Payments

Greece is exceptional among the countries of eastern Europe in that she has always relied as much on commercial and other kindred activities entering into the balance of payments as on the actual production of export goods. Indeed, before 1932 the value of the invisible items frequently exceeded that of the visible items in her foreign accounts. Also, until quite recent years, she has relied upon the regular importation of foreign capital to finance a portion of her imports (see p 172).

The Greek balance of international payments for the year 1937 is shown in the table on p. 148, in which the figures are given in gold francs. The increase of exports by 62 million gold francs from 1936 to 1937 was more than offset by a rise in imports of 83 million gold francs. The most striking item, however, in the asset figures is the large increase in the clearing balance, an active balance of 3·9 million

Balance of International Payments, 1937, in thousands of Gold Francs

Assets			Liabilities		
I MOVEMENT OF COMMERCE AND SERVICES			I MOVEMENT OF COMMERCE AND SERVICES		
1. Exports	269,038		1 Imports	417,422	
2 Emigrants' remittances	91,245		2. Insurance premiums	1,000	
3 Devisen† accruing from shipping	25,008		3 Expenses of Greeks travelling abroad	11,117	
4 Expenses of foreigners travelling in Greece	23,500		4 Interest and dividends of foreign capital funds invested in Greece	16,000	
5 Interest on the disposal devisen funds of Greek banks abroad	873		5 Service of External Public Debt	22,516	
6 Interest and dividends invested abroad	26,500		6. Other state requirements	24,422	
7 Coupons of Greek National Loans paid in Greece	11,314				492,477
8 State account	5,390				
		452,868			
II. MOVEMENT OF FUNDS			II. MOVEMENT OF FUNDS		
1. Decrease of disposal devisen funds of shipowners and Loans contracted by them	45,020		1. Payment of arrears of old commercial debts	3,021	
2 Decrease of the disposal devisen funds of Greek banks	6,000		2. Purchase of ships	45,020	
3 Increase of passive balances on clearing account	19,811		3. Restitution of deposits in foreign exchange	6,000	
		70,831	4. Increase of the gold and devisen reserve of the Bank of Greece	9,137	
					63,178
III OTHER RESOURCES					
Items incapable of exact estimation, e.g remittances from emigrants otherwise than through Banks; decrease of the devisen reserve funds of private persons, inflow of capital funds, etc.		31,956			
	Total	555,655		Total	555,655

Source· Department of Overseas Trade *Report on Economic and Commercial Conditions in Greece*, 1938, p 6 (London, 1938).

† Devisen are claims on foreign currency.

gold francs in 1936 being converted to a passive balance of 19·8 million in 1937. On the liabilities side the efficacy of the exchange restrictions is shown by the increase of gold and other reserves of the Bank of Greece—a gain of 9 1 million gold francs as against a loss of 21 million for the previous year.

Import Trade

Unlike the export trade, which consists of but a few commodities, the imports of Greece are numerous and varied, for, despite the increased industrialization of the country over the period 1929–38, a considerable proportion of manufactured goods have still to be imported. In addition, Greece imports large quantities of cereals and other agricultural products.

The Greek customs authorities divide commodities into twenty-four categories, and the following table gives the import returns for 1936 and 1937:

Greek Imports by Commodities, 1936 and 1937, in thousands of drachmae

Imports	1936	1937
Animal and fishery products	764,932	762,294
Agricultural products	2,550,843	3,394,970
Horticultural and colonial products	221,092	180,166
Oleaginous seeds and fruits	102,070	326,419
Alcoholic beverages	3,905	6,890
Sugar and confectionery products	327,386	452,832
Leather goods	288,791	356,250
Forestry products	548,923	695,714
Minerals	1,122,304	1,509,429
Metals and metal articles	1,718,635	2,417,158
Scientific and musical instruments	250,734	333,463
Pottery and glassware	121,039	134,161
Chemicals and pharmaceutical products	594,800	844,376
Essences and perfumes	19,837	28,377
Dyes	142,150	168,882
Paper and paper products	301,439	337,899
Rubber and rubber products	52,194	87,619
Textiles and textile materials	2,058,510	2,201,714
Sports equipment	11,855	15,119
Hats	18,337	20,587
Vehicles	324,702	430,506
Arms and explosives	218,231	103,145
Naval equipment	141,533	195,830
Miscellaneous	58,378	200,563
Total	11,962,620	15,204,363

Source: *Annuaire statistique de la Grèce*, 1938, p. 154 (Athènes, 1939)

In 1937 the following seven groups included the most important commodities, representing nearly 80% of all imports.

Agricultural Products

Foremost among the imports of agricultural products were the cereals. Purchases in 1937 were rather above the normal as a result of the failure of the Greek harvest in 1936, some 505,810 tons of wheat, value 2,767 million dr., were imported, and of this total Argentina supplied 30% and Roumania about the same quantity. Other cereal imports included rice, value 204 million dr., of which more than half came from Egypt, maize, value 153 million dr., coming mainly from Roumania and Jugoslavia, and barley, value 26 million dr. This group also included haricot beans, value 168 million dr., supplied by Jugoslavia, Hungary and Roumania, and a small import of potatoes, value 13 million dr.

Machinery, Metals and Metalware

This category includes a great variety of products, the most important being rolled or drawn iron, imports of which were valued at 512 million dr. in 1937. Other important items are sheet iron—276 million dr., industrial machinery—243 million dr., wire and steel cables—179 million dr., spare parts—168 million dr., ironware—162 million dr., sheet copper—107 million dr, and agricultural machinery—103 million dr. Also included in this category are substantial quantities of iron pipes and tubes, engines, sewing-machines, dynamos and electric motors, tin, copper tubes, pumps, cutlery, nails, bolts, nuts, pins, needles, tools, locks, keys, copper and aluminium ware, and other household utilities.

Largely as a result of clearing agreements, German products had achieved a completely dominating position throughout this wide range of imports. In 1937, some 63% of the metal and machine trade imports were derived from Germany and only 7% from the United Kingdom. Austria, Sweden, Belgium and the U.S.A. also had significant shares in the supply of many of these imports.

Textiles and Textile Materials

This category included a variety of raw materials, such as hemp, jute, flax, esparto grass, cotton and wool, as well as spun yarns and finished piece goods. The most important raw material was ginned cotton, imports of which were valued at 103 million dr. in 1937 and

came almost entirely from Egypt (56 million dr.) and India (39 million dr.). It is interesting to note that imports of high grade cotton from the U.S.A. have been replaced in recent years by increased production of good quality cotton in Greece. The value of cotton yarns and piece goods imported was 775 million dr., of which the United Kingdom supplied about 41%. Imports of wool, woollen yarns and woollen piece goods amounted to 918 million dr., the share of the United Kingdom in this case being 66% of the total. The clearing agreements which Greece had contracted with certain countries, especially Germany and Italy, definitely placed United Kingdom exporters at a disadvantage.

Minerals

The principal mineral imports are coal, coke, petroleum and other oil products. Coal imports for 1937 were valued at 656 million dr. and more than 50% came from Germany. Coal from the United Kingdom was gradually being supplanted by German coals which had obtained a firm hold on the market (see p. 148). The U.S.S.R. ranked third, and supplied 15%. Coke imports to the value of 65 million dr. were drawn almost entirely from Germany, the share of the United Kingdom in this trade being almost negligible. Imports of crude oil had been gradually rising for a number of years, and in 1937 were valued at 373 million dr., while a further 319 million dr were expended on imports of paraffin, benzine, lubricating oils and other oil products. The principal source of the oil imports is Roumania, which supplies almost 70% of the Greek requirements, the remainder being mainly derived from the U.S A.

Chemicals and Pharmaceutical Products

Quinine salts—90 million dr., sulphate of soda—85 million dr., fertilizers—79 million dr., pills and capsules—56 million dr., sulphate of ammonia—54 million dr., and medicinal oils—54 million dr. provided the chief items under this heading. In addition such commodities as caustic soda, carbonates of soda, potash, citric and tartaric acids, inks and pharmaceutical specialities had some importance. Here again, Germany was appropriating an ever-increasing share in yet another branch of the Greek import trade, and by 1937 was supplying about one-third of the chemical imports, while the United Kingdom provided one-sixth. Italy, France and the Netherlands had important shares in the provision of certain commodities.

Animal and Fishery Products

Greece is under the necessity of having to draw upon foreign countries for a considerable proportion of her livestock requirements, and these are mainly supplied by her Balkan neighbours. Oxen, cows, buffaloes, goats and sheep to the value of 389 million dr. were imported in 1937, Jugoslavia providing about 60% and Turkey some 10% of this total. Minor quantities of meat and dairy products are also imported. Imports of fish and fishery products amounted to 220 million dr., and of this amount 31 million represented the purchase of fresh fish. Large quantities of salted or smoked herrings —40 million dr., and dried cod—108 million dr., are consumed. Turkey supplied most of the fresh fish, the United Kingdom practically all the herrings, and the cod trade is divided among Newfoundland, Norway, Denmark, France and the United Kingdom.

Forestry Products

Timber for constructional purposes had for the most part to be imported, and in 1937 the total amounted to 577 million dr. In addition, imports of wood for cabinet-making and joinery totalled 34 million dr., and for barrel-making almost exactly the same figure. Supplies were drawn chiefly from Roumania, Austria and Jugoslavia, but Sweden, Poland and the U.S.S R. also shared in the trade.

Other Commodities

Sugar and confectionery products, mechanical vehicles, leather and hides, paper, scientific and musical instruments, and oleaginous seeds and fruits were among the smaller items which constituted other essential imports.

Export Trade

In 1937 the export trade of Greece totalled 1,376,664 tons valued at 9,555 million dr. and consisted almost entirely of agricultural and horticultural products and some minerals. Official statistics represent export returns in the same twenty-four categories that are used for the classification of imports, but only three of these categories had a value exceeding 5% of the total exports, seven had between 5% and 1%, and no less than fourteen represented less than 1% each. The table on p. 153 gives the thirty-six main commodities, classified by categories, with their 1937 export values.

Chief Exports in thousands of drachmae, 1937

Category	Commodity	Thousands of drachmae
Horticultural and colonial products	Tobacco (leaf)	4,383,935
	Currants	979,296
	Sultanas	445,364
	Citrus fruits	162,383
	Dried figs	158,529
	Fresh grapes	47,918
	Almonds	46,406
	Carobs	36,022
Oleaginous seeds and fruits	Olives	262,715
	Olive-oil	241,210
	Olive-kernel oil	51,871
Alcoholic beverages	Wine in bulk	215,598
	Brandies	46,064
	Must	12,258
Forestry products	Colophony	178,952
	Turpentine	74,104
	Gum mastic	31,413
Leather goods	Raw hides	328,636
Minerals	Chrome ore	85,620
	Iron pyrites	82,394
	Magnesite (burnt)	76,923
	Iron ores	70,885
	Magnesite	43,835
	Bauxite	44,383
	Emery	43,011
	Magnesite (dead-burned)	27,015
	Manganese	1,126
Textiles	Cotton yarns	85,705
	Wool and hair	47,341
	Woollen carpets	49,011
Metals	Iron scrap	48,610
	Lead (in pigs)	34,673
Chemicals	Fertilizers	43,514
	Tartrate of lime	19,288
Dyeing and tanning	Valona oak extract	19,456
Agricultural and fishery products	Sponges	35,982

Source D O T. *Report on Economic and Commercial Conditions in Greece*, 1938, pp. 53–59 *passim* (London, 1938).

The thirty-six commodities detailed in this table represent in value approximately 90% of the total exports in 1937. One category, that of horticultural and colonial produce, alone supplied 66% of all exports, while those of oleaginous seeds and fruits, and minerals, each took up a further 6%.

Horticultural and Colonial Products

The extraordinary importance of the tobacco crop (see p. 62) to the Greek economy may be judged from the fact that in 1937 it represented 45·5% of the total exports, and this was a little below the average figure for previous years. It is not surprising, therefore, that those countries which were the largest buyers of this commodity occupied a most favourable bargaining position in their commercial relations with Greece, particularly at a time when bilateral trading agreements were the chief instruments of trade control. The United Kingdom was here at a disadvantage, for the British public much

prefer Virginia tobacco. In 1937 Germany took 42% of the tobacco exports and the U.S.A. some 30%, while Italy and Czechoslovakia were considerable importers.

In the same year, currants and sultanas (see p. 68) represented 12·4% of total exports. Their principal market was found in the United Kingdom, which took about 50% of the combined exports. Germany followed with 20%, and the Netherlands, Italy, Czechoslovakia, Jugoslavia and the U.S.A. took the remainder. Although the choicest varieties cannot be equalled anywhere in the world, improvement can still be made in the general quality, packing and cleanliness of the crop.

Oleaginous Seeds and Fruits

About 6% of the total exports were made up of the olive and its products (see pp. 66–8). The trade was well distributed over several countries, but the U.S.A. appeared as the chief buyer, taking about 30% of the export and Italy followed with some 20%. Egypt, Roumania and Bulgaria also made considerable purchases.

Alcoholic Beverages

Wines, brandies and other alcoholic beverages (see pp. 133–4) only represented 3% of the total exports Germany took 50% of the wine, and France, Belgium, the Netherlands and the U.S.A. each had some share in sections of this trade

Forestry Products

Exports in this category were 3·4% of the total, and were made up of three chief commodities, colophony, turpentine, and gum mastic (see p. 134). Italy, taking 50%, was the principal purchaser, while Roumania and Germany were the next largest buyers.

Leather Goods

Greece is deficient in heavy hides for the leather industry, but there is an export surplus of sheep and goat skins, which make up just over 3% of the total exports (see p. 134). In 1937 they were principally directed to Germany, Italy and the countries of south-eastern Europe.

Minerals (see pp. 111–20)

These were quite an important section of Greek exports, amounting, in 1937, to some 6% of the total Chrome ore was the largest individual item, being closely followed by iron ore and pyrites, magnesite, bauxite, and emery. Germany was easily the largest purchaser of Greek mineral exports, taking about 35% of the total.

Italy, the United Kingdom, the Netherlands, the U.S.A. and France were also considerable importers of most items.

Textiles

Cotton yarns, raw wool and hair and woollen carpets made up 2% of the total Greek exports in 1937. Balkan neighbours purchased the cotton yarns, which were mainly of a coarse variety, Jugoslavia and Germany accounted for the majority of the wool and hair, and the carpets also went mainly to Germany, with small quantities to Switzerland and the United Kingdom (see pp. 120–4).

Other Commodities

The exported products of the modern Greek armament industry amounted to 4·2% of total Greek exports and consisted mainly of ammunition for the Balkan countries. Exports of scrap iron (mostly from ship-breaking), pig lead, fertilizers (see p. 127), tartrate of lime, tanning extracts from the Valona oak, and sponges (see p. 99) were all of some slight importance.

Foreign Trade by Countries

The following table shows the value of Greek imports and exports by countries in 1936 and 1937:

Greek Imports and Exports by Countries in 1936 *and* 1937

Country	Imports (1,000 dr)		Exports (1,000 dr)	
	1936	1937	1936	1937
Germany	2,676,388	4,134,231	2,688,072	2,959,768
United Kingdom	1,926,826	1,667,527	899,227	922,468
U S A.	845,891	651,939	1,056,801	1,580,497
Roumania	633,727	1,692,258	264,458	235,854
Jugoslavia	691,959	839,780	228,498	274,941
Argentina	277,597	996,615	57,038	63,318
Italy	59,035	437,193	132,672	601,217
Egypt	235,395	552,375	200,253	245,477
Czechoslovakia	219,463	279,796	156,781	383,736
Netherlands	227,787	375,427	237,616	273,858
Sweden	370,756	272,199	234,263	140,872
France	229,744	266,141	241,538	240,741
Austria	245,820	382,348	168,255	165,318
Hungary	184,086	463,215	49,006	111,636
Turkey	176,968	202,121	46,437	55,644
India	274,869	355,900	2,328	4,488
U.S.S R.	551,616	243,965	65,595	69,347
Others	2,134,693	1,391,333	650,039	1,226,113
Total for all countries	11,962,620	15,204,363	7,378,877	9,555,293

Source. D.O.T *Report on Economic and Commercial Conditions in Greece*, 1938, p. 33 (London, 1938).

Trade with Germany

In 1937, Germany was the largest supplier of Greek imports and the largest importer of Greek goods. Imports from Germany represented 27·2% of the total Greek import trade by value. Greek exports to Germany represented 31% of the total export trade by value.

Imports from Germany covered a wide range of commodities, particularly in the metal, chemical and machinery categories. The more important items are given in the following table:

Imports by Commodities in million drachmae

Commodity	Value in million dr.	Commodity	Value in million dr.
Coal	395	Electrical porcelain	26
Iron, rolled or drawn	345	Mineral and metallic colours	26
Cotton piece goods	260	Motor-car chassis	22
Iron, sheet	170	Copperware	21
Machinery, industrial	163	Lamps	20
Wire and steel cables	133	Carbonate of soda	19
Ironware	127	Sewing machines	18
Electrical apparatus	92	Domestic utensils	18
Woollen yarns	87	Motor-car accessories	18
Woollen piece goods	86	Locks and keys	17
Mechanical spare parts	85	Dynamos and electric motors	17
Coke	60	Knives, forks and spoons	16
Engines	57	Oils and greases	16
Iron pipes and tubes	56	Aluminium	15
Sulphate of ammonia	54	Builders' hardware	14
Machinery, agricultural	51	Tyres	14
Scientific instruments	48	Photographic paper	13
Pills and capsules	44	Pins, needles, hooks and pens	13
Cotton yarns	43	Earthenware	13
Pharmaceutical specialities	39	Sulphate of soda	12
Leather	36	Nails, bolts and nuts	12
Tools	29	Toys	12
Copper, sheet	29	Wrapping paper	12
Coal-tar colours	29	Naphthalene	11
Glass	29	Copper tubes	11
Fertilizers	28	Tractors	11

Source. D.O T. *Report on Economic and Commercial Conditions in Greece*, 1938, pp. 35–59, *passim* (London, 1938).

Of Greek exports to Germany leaf tobacco was by far the most important. The chief commodities are listed in the table on p. 157.

Exports by Commodities in million drachmae

Commodity	Value in millions of drachmae	Commodity	Value in millions of drachmae
Tobacco	1,880	Woollen carpets	29
Sultanas	162	Bauxite	26
Currants	158	Colophony	24
Citrus fruit	116	Chrome ore	17
Wine	100	Iron pyrites	14
Raw hides	99	Wool and hair	14
Magnesite	71	Valona oak extract	12
Dried figs	37	Sponges	8
Iron ores	32		

Source. D.O T. *op cit*, pp. 35–59, *passim* (London, 1938).

Trade between Greece and Germany increased very considerably from 1933 onwards as a result of the German policy of importing as much as possible from the countries of south-eastern Europe. In consequence of these purchases, particularly of tobacco and minerals, Greece tended to accumulate large balances of 'frozen' Reichsmarks, and had therefore to procure a large portion of her imports from Germany in order to obtain effective payment (see p. 145). These imports were spread over quite a wide range of manufactured goods, but were particularly important in the metals and metal manufactures, machinery and textiles. On the whole it would appear that the Germans did not exploit Greece too severely during these years, but there can be no doubt that the principal object of German trade policy was to make south-eastern Europe an integral part of their developing war economy.

Trade with the United Kingdom

In 1937 the United Kingdom ranked third as supplier of Greek imports—British goods representing 11% of the total Greek import trade by value. In the same year the United Kingdom also stood third as receiver of Greek exports—this trade representing 9 6% of the Greek export trade by value. In the value of imports and exports combined, the United Kingdom ranked second.

The principal imports and exports from the United Kingdom are given in the tables on p. 158.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Wool and hair	273	Machinery, industrial	27
Cotton piece goods	227	Mechanical spare parts	26
Woollen yarns	216	Wire and steel cables	24
Woollen piece goods	120	Sheet iron	16
Coal	112	Dried codfish	13
Cotton yarns	95	Cocoa	13
Sulphate of soda	59	Linen, hemp and jute goods	12
Sugar	51	Scientific instruments	11
Herrings, salted and smoked	34	Ironware	11
Medicinal oils	31		

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Currants	613	Sponges	13
Sultanas	98	Chrome ore	12
Tobacco	26	Colophony	11
Magnesite (all types)	18	Olive products	10

Source D O T *op cit*, pp 35–59, *passim* (London, 1935)

Trade with the U S.A.

In 1937, the U.S.A ranked sixth as supplier of Greek imports and accounted for 4·3% of the Greek import trade by value. In the same year the U.S.A. stood second as receiver of Greek exports, a trade which represented 16·5% of the total Greek export trade by value. In value of imports and exports combined, the U.S.A. ranked third.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Crude oil	112	Leather	21
Mineral oils and greases	49	Machinery, industrial	21
Motor-car chassis	36	Benzine	16
Motor-car accessories	35	Mechanical spare parts	15
Sheet iron	35	Wood for barrels	13
Tyres	29	Electrical apparatus	12
Motor vehicles	25	Wireless sets	11
Rice	24	Fertilizers	11
Machinery, agricultural	22	Cinematograph film	11

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Leaf tobacco	1,239	Olive-kernel oil	35
Olive-oil	60	Currants	30
Olives	57	Brandies	18
Chrome ore	38	Dried figs	11

Source D O.T , *op cit* , pp 35–59, *passim* (London, 1938)
Tartrate of lime, emery, and citrus fruits, were also exported in small quantities

Trade with Roumania

In 1937, Roumania stood second as supplier of Greek imports and accounted for 11% of the total Greek import trade by value. As receiver of Greek exports, Roumania ranked tenth, accounting for no more than 2·5%. In value of imports and exports combined Roumania was fourth in importance. Roumania was particularly important to Greece as a source of cereals.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Wheat	867	Paraffin	36
Crude oil	261	Livestock	30
Constructional timber	177	Haricot beans, dried	28
Benzine	165	Barley	24
Maize	72	Mineral oils and greases	13

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Olives	82	Raw hides	15
Colophony	31	Sultanas	9
Turpentine	18	Cotton yarns	8
Citrus fruit	15		

Source D O T , *op cit* , pp 35–59, *passim* (London, 1938).

Trade with Jugoslavia

In 1937, Jugoslavia ranked fifth as supplier of imports to Greece, and these represented 5·5% of the Greek import trade by value.

Her position as receiver of Greek exports was also fifth, representing 3% of the total Greek exports. Appropriately, in value of imports and exports combined, Jugoslavia again ranked fifth in importance.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Wheat	258	Maize	48
Goats and sheep	193	Oxen, cows, buffaloes and calves	44
Constructional timber	116	Wood for barrels	12
Haricot beans, dried	92		

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Cotton yarns	75	Dried figs	25
Sultanas	48	Citrus fruit	12
Scrap iron	35	Colophony	11
Wool and hair	25	Turpentine	5

Source. D.O T., *op cit*, pp 35–59, *passim* (London, 1938).
Small exports of other products included emery, bauxite, woollen carpets and wines

Trade with Argentina

In 1937, Argentina came fourth as supplier of Greek imports—mainly as a result of the cereal trade—and took up some 7·5% of the Greek import trade by value. Argentina received a very small amount of the Greek exports, in fact something less than 1%. However, in value of imports and exports combined Argentina stood sixth.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Wheat	899	Vegetable tanning materials	31
Maize	31	Raw hides	16

Source: D.O.T., *op. cit*, pp. 35–59, *passim* (London, 1938).

Exports from Greece were made up of olives (23 million dr.) and olive-oil (32 million dr.). No other commodities were of noteworthy significance.

Trade with Italy

In 1937, Italy was ninth among the suppliers of Greek imports, accounting for about 2·9% of the total import trade by value. As a receiver of Greek goods Italy was fourth, with some 6·2% of the total Greek exports by value. In value of imports and exports combined Italy was seventh.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Cotton piece goods	70	Sulphate of soda	14
Woollen yarn	62	Hemp	13
Sulphur	39	Rice	12
Caustic soda	28	Sheet iron	12
Linen, hemp and jute goods	16	Acids	12
Tyres	15	Wire and steel cables	5

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Tobacco	170	Dried figs	22
Colophony	82	Iron pyrites	14
Raw hides	74	Chrome ore	10
Currants	43	Iron ore	8
Turpentine	43	Emery	5

Source: D O T., *op. cit*, pp. 35–59, *passim* (London, 1938).

Trade with Egypt

In 1937, Egypt ranked seventh as supplier of Greek imports, accounting for 3 25% of total imports by value. In the same year Egypt accounted for 2·5% of Greek exports by value and stood eighth in importance among the customers of Greece. In the value of imports and exports combined, Egypt ranked eighth.

Imports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Wheat	276	Bitumen	19
Rice	114	Fertilizers	13
Ginned cotton	56	Molasses	10

Exports

Commodity	Value in million drachmae	Commodity	Value in million drachmae
Tobacco	71	Olive-kernel oil	13
Olives	34	Olive-oil	10
Fertilizers	25	Almonds	10
Brandies	23	Colophony	4
Table grapes	16	Gum mastic	3

Source D O.T, *op cit*, pp. 35–59, *passim* (London, 1938)

Trade with certain other countries

Greek trade with other European industrialized countries, such as Czechoslovakia, the Netherlands, France and Sweden, followed the general pattern set by the German and British trades. Imports consisted for the most part of manufactured goods, while exports were predominantly composed of tobacco, currants and raisins, olives, wines, raw hides and some mineral ores.

In 1937, Greece also had a considerable import trade from India, the U.S.S.R. and Turkey. India supplied Greece with quite large quantities of rice, linseed, hemp, jute, gunny bags and ginned cotton, but took practically no Greek exports. The U.S.S R. provided quantities of wheat, constructional timber, coal and cast-iron, but purchases of Greek exports were confined almost entirely to tobacco. Turkey sold cattle, goats and sheep, fresh fish and coal to Greece, and in return received gum mastic and some cotton yarns.

Bibliographical Note

1 Detailed statistics of trade returns, by categories and by countries, by weight and by value, are given in the *Annuaire statistique de la Grèce*, 1939 (Athènes, 1940)

2. The Reports of the Department of Overseas Trade (see Bibliographical Note, p. 141) provide valuable information

3. Useful commentaries on Greek economic and commercial affairs are afforded by *The Balkan States*, vol I, 'Economic', *A Review of the Economic and Financial Development of Albania, Bulgaria, Greece, Roumania, and Yugoslavia since* 1919 (London, 1936), prepared by the Royal Institute of International Affairs, and by the *Special Memorandum* No. 48, *South-Eastern Europe* (London, 1939), of the London and Cambridge Economic Service

4. Details of the trading agreements made by Germany in the years prior to the present war are contained in N. Momtchiloff, *Ten years of controlled trade in south-eastern Europe* (Cambridge, 1944).

Chapter VI

FINANCE

Currency. The Budget The National Debt· Financial Institutions Agricultural Finance· Conditions since September 1939 Bibliographical Note

Currency

Coinage and Bank-Notes

Coinage. The monetary unit of Greece is the drachma, which contains 100 lepta. Currency in circulation consisted of bank-notes issued by the Bank of Greece, and coins minted by the government but put into circulation through the Bank. The coins were as follows:

Denomination	*Composition*
10 lepta	90% aluminium
20 ,,	25% nickel, 75% copper
50 ,,	,, ,,
1 drachma	,, ,,
2 drachmae	,, ,,
5 ,,	99% nickel
10 ,,	50% silver, 40% copper, 5% nickel, 5% tin
20 ,,	,, ,, ,, ,,

At the end of 1938, the actual coinage in circulation amounted to 385 million dr. or about 55 dr. per head of the population. The coins were legal tender, but only the Bank of Greece was obliged to accept them in unlimited quantities. Other persons and institutions had to accept them up to the following limits: 20 dr. coins up to 500 dr., 10 or 5 dr. coins up to 200 dr., 2 or 1 dr. coins up to 50 dr., and smaller coins up to 10 dr.

In 1938, the government ordered new coins, ostensibly in order to replace the republican inscriptions of the old ones, but in reality to demonetize silver and to derive some revenue from the exchange. These new coins were to be minted in England, but the exchange of the coins was prevented by the outbreak of war.

Bank-Notes. The bulk of the monetary circulation consisted of bank-notes issued in denominations of 50, 100, 500, 1,000 and 5,000 dr. The total circulation fluctuated in 1939 between 6,600 million dr. in March and 10,600 million in September; the average during the first seven months of that year was 7,500 million or about 1,050 dr. per head of the population.

History of the Monetary Unit

In 1868, Greece joined the Latin Monetary Union, together with Switzerland, Italy, Belgium and France, in order to create a common currency based on gold. The monetary unit was equal to ·290 grm. of fine gold and became generally known as the gold franc of 100 centimes, although in Greece it was called the drachma and was divided into 100 lepta. It was intended that the coinage of all members of the Union should be legal tender throughout the Union. The Greek government early failed to comply with the project and substituted an issue of irredeemable paper money instead of gold coins. By 1893, depreciation had been such that the gold franc was quoted at 1·65 drachmae and the financial embarrassment of the Greek government was so acute that, unable to stabilize its currency or balance its budget, it decided to default on the government debt.

This action affected the interests of the Great Powers, and so in 1898 an International Finance Commission was constituted to control Greek government finances in order to safeguard the service of the existing foreign debt. The Greek government could not then contract further debt or change the revenue laws without the approval of the Commission. By administering the collection of the taxes on tobacco, the stamp taxes, and the customs dues of the port of Piraiévs and by supervising the state monopolies in salt, crude petroleum (in 'Old' Greece), matches, cigarette paper and emery, the Commission was able to balance the budget, restore the currency to parity and pay the interest on the government debt, both domestic and international. The stability and confidence induced by the administration of the Commission resulted in a renewed willingness among foreign lenders to make further advances.

The major wars in which Greece was engaged between 1912 and 1922 brought many changes in the financial sphere. The Latin Monetary Union became inoperative and was finally abolished in 1926. The financial burden of the wars coupled with the cost of reconstruction led by way of a steady increase in the national debt (see p. 172) to serious inflation. The gold value of the drachma in 1923 was only some 6½% of what it had been in 1912, while the note circulation increased by more than thirty times during the same period.

Eventually, with the help of League of Nations loans, the drachma was stabilized, actually in 1926, and legally in 1928, at a gold equivalent of ·0195 grm. and an exchange rate of 375 dr. = £1.

Greek central banking had to be reorganized in accordance with the terms of the loans, and on 14 May 1928 the Bank of Greece replaced the National Bank. The new central bank circulated coins minted by the government and possessed a monopoly of note issue; it was obliged on demand to redeem notes in foreign exchange, and the drachma thus became a gold exchange currency. In practice this led to a very close association between the drachma and the pound sterling.

For a little while the financial position seemed more stable; but when the Bank of England decided to leave the gold standard at the

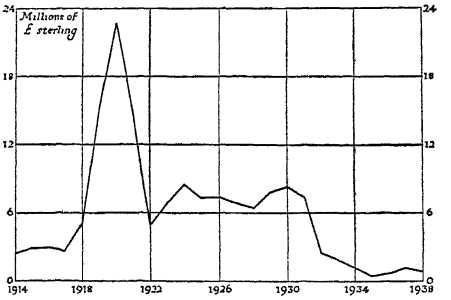


Fig 30 Annual remittances of Greek emigrants in £ sterling

Based on *Annuaire statistique de la Grèce*, 1939, p 497 (Athènes, 1940)
The figures were given in £ sterling up to 1930, in stabilized drachmae between 1930 and 1934, and in gold francs from 1935 onwards The gold francs were converted into £ sterling by means of the average sterling dollar exchange rate, from conversions given in the *Federal Reserve Bulletin* (Washington, monthly).

time of the financial crisis in September 1931, the government and the Bank of Greece had to choose whether to follow the pound and leave the gold standard, or whether to adhere to gold and let the pound depreciate. At first the latter course was adopted; the drachma was tied to the dollar at the existing parity of 1 $ = 77 05 dr., and all dealings in foreign exchange were rigidly controlled. The depreciation of the pound reduced the interest on the sterling debt and cheapened imports from the sterling countries, but these advantages were more than offset by a fall in Greek exports and shipping revenues. Concurrently, the foreign exchange restrictions and the economic depression in the United States of America led to a great diminution of emigrants' remittances (Fig. 30), so that it became particularly difficult to maintain a balance of payments. Between October 1931 and April 1932, reserves of gold and foreign exchange

in the Bank of Greece were drained away, until on 15 April complete default was declared on all the foreign liabilities of the government (see p. 172). Ten days later the gold exchange standard was formally renounced and the drachma at once depreciated by almost 50%. Exports increased and thereby implemented the gold and foreign exchange reserves of the Bank. The discount rate was gradually decreased until by December 1932 it reached its pre-crisis level of 9%. Foreign creditors, both governments and individuals, clamoured for a settlement of their claims. In consequence the foreign exchange restrictions were tightened up, and, in addition to the strictest economy, the government sought to control all holdings by a decree of 29 July 1932, since known as the Drachmification Law, which ordered the compulsory conversion into Greek currency of all private holdings of foreign exchange at the arbitrary rate of 1$ = 100 dr., instead of the market rate of 1$ = 145 dr. Payment of commercial debts was authorized on the basis of ten half-yearly instalments, while protracted negotiations took place with regard to the government debt (see p. 173).

In February 1933, the value of the drachma was stabilized again, and this time linked to the Swiss franc at the rate of 1 Swiss franc = 34·6 dr., indicating a total depreciation to one-thirtyfifth of its value in 1912 (The Swiss franc had remained equal to the gold franc of the Latin Monetary Union.) This relationship was maintained until September 1936, when the simultaneous devaluation of French, Netherlands and Swiss currencies induced the Greek authorities to tie the drachma to sterling again, the rate being fixed at 540–50 dr = £1. At this level the drachma was worth only 3% of its pre-1914 gold value. This rate of exchange, however, was the artificial product of severe restrictions and not the result of free international payments, and it only operated in respect of a few countries, such as the United Kingdom and the United States. The drachma followed the pound within these limits for the next four years. In consequence it suffered a devaluation of 5% in relation to gold in the autumn of 1938, and another of about 14% at the outbreak of war in September 1939. These two movements had little effect on Greek economic life since commercial and financial transactions with other countries were subject to special 'clearing' rates, the most important of which was that in relation to the Reichsmark, fixed in 1938 at 1 Rm. =43 dr.

The Budget

All expenditures and revenues of the Greek government were included in a single budget. Estimates of expenditures for the Ministries were prepared by each Minister with the assistance of a public accounting official These estimates were then submitted to the Minister of Finance for his approval. Revenue estimates were prepared by officials in the Ministry of Finance. The Budget was compiled from these estimates by the Director of the Budget, who was attached to the office of the Director-General of Public Accounting.

The Greek budget was not conspicuously unbalanced during the years immediately preceding the outbreak of the war in Europe. However, almost every year government borrowing exceeded debt redemption.

The following table gives the government revenues and expenditures (in millions of drachmae) in Greece between 1933 and 1939:

Year	Revenue	Expenditure	Surplus
(*a*) 1933–4	8,476	7,705	771
(*a*) 1934–5	9,237	8,745	492
(*b*) 1935–6	10,645	10,048	597
(*b*) 1936–7	13,243	12,682	561
(*c*) 1937–8	14,130	13,411	719
(*c*) 1938–9	13,846	12,702	1,144

Source. *Annuaire statistique de la Grèce*, 1939, p. 321 (Athènes, 1940)

(*a*) Returns complete.
(*b*) Returns almost complete
(*c*) Provisional returns

The general level of expenditures since 1935 has been over 12 million dr. per annum, of which by far the largest items were for the armed forces and for the payment of interest on the national debt.

Sources of Revenue

Compared with that of other Balkan countries, Greek taxation was very high, being approximately double that of its neighbours. According to an official study in 1932–3, taxes, including local taxes, amounted to 25·66 % of the national income, or without local taxes, 24·35 %. In 1939 tax receipts of the central government amounted to approximately 24 % of the national income.

*Revenue and Expenditure, 1937–9**

REVENUE	1937–8		1938–9		EXPENDITURE	1937–8		1938–9	
	Million dr	%	Million dr	%		Million dr	%	Million dr	%
ORDINARY					MINISTRIES				
Direct Taxes	2,988	18	3,264	21	Finance	5,323	33	5,542	36
Indirect Taxes	6,460	39	6,527	41	Foreign Affairs	231	1	235	2
Monopolies	688	4	678	4	Justice	385	2	376	2
Stamp taxes	814	5	883	6	Home Affairs	818	5	874	6
Other taxes	552	3	635	4	Transport	1,633	10	1,602	10
State services	447	3	475	3	Railways	54	0	60	1
State Lands	189	1	208	1	Education	965	6	1,001	7
Other receipts	686	4	779	5	National Economy	129	1	54	0
Exceptional receipts	780	5	603	4	Labour	56	0	52	0
CAPITAL MOVEMENTS					Agriculture	565	4	553	4
New Borrowing	2,972	18	1,817	11	Public Health	1,152	7	1,108	7
Sale of State property	2	0	2	0	War	2,984	18	2,429	16
					Admiralty	1,157	8	748	5
					Mercantile Marine	62	0	72	0
					Air	845	5	581	4
					Legislative Body	16	0	8	0
Total	16,578	100	15,871	100	Total	16,375	100	15,205	100

Source. *Annuaire statistique de la Grèce*, 1939, p. 318 (Athènes, 1940)

* These figures are provisional estimates and therefore do not agree exactly with the actual receipts and expenditures

In pre-war years, receipts from local taxation were only about one-tenth as much as the taxes of the central government. In 1938, local taxation amounted to 1,269,105,111 dr. Real estate and other property of local authorities yielded an additional income of 244,774,684 dr.

Direct Taxation. Until recent years there has been considerable difficulty in efficiently administering the assessment and collection of direct taxation in Greece. According to a statement of the Director of Direct Taxes in 1934, there were many loopholes, legal and otherwise, for evading the income tax. In 1938, however, it was reported that the government had reduced tax evasion from 15–20 % in 1932, to about 8 % of the total amount levied.

Analysis of Tax Revenues of the Greek Government

Nature of Tax	1937–8 (1,000 dr)	1938–9 (1,000 dr)
DIRECT TAXES		
Income taxes	1,125,982	1,352,380
On agricultural production	574,807	560,043
Business and licence taxes	346,642	362,083
Transfer of property taxes	276,053	316,120
Turnover tax	631,538	638,821
Supplementary taxes	32,540	34,942
Total	2,987,562	3,264,389
INDIRECT TAXES		
Import duties	3,857,289	3,721,116
Export duties	35,352	32,231
Consumption taxes*	2,523,971	2,730,006
Supplements to direct taxes	43,709	43,847
Total	6,460,321	6,527,200
OTHER FORMS OF TAX		
Monopolies	688,342	678,296
Stamp taxes	814,162	882,425
Other taxes	552,200	635,423
Total	2,055,704	2,196,144
GRAND TOTAL	11,503,587	12,987,733

Source *Annuaire statistique de la Grèce*, 1939, pp 318–20 (Athènes, 1940)

* Largely on tobacco

Income tax accounts for about 10 % of the national tax revenue. There are six different schedules which relate taxation to source of income. Thus unearned income coming from real property, rent of land, and investments, form the subjects of the first three schedules, the fourth deals with profits of commercial and industrial enterprises, the fifth with salaries and wages, and the sixth with incomes from the liberal professions. In this way, there is a comprehensive, but rather complicated, network of specific income taxes.

In addition there was a general income tax which compared with the British super-tax. It was levied on the net income received by any person domiciled in Greece. The amount on which the tax was based could not be less than the presumed income, which was inferred from such indications as house rent and ownership of a motor-car. In 1936, the rate of this tax was 1 % on total income up to 75,000 drachmae, increasing to 25 % with the largest incomes.

Other important direct taxes comprised the inheritance tax (on each heir's share), a tax on gifts and dowries, taxes on agricultural production, a tax of 14 % on lottery gains of over 1,000 drachmae, and a tax on the transfer of real property (4·2 % on buildings and 2·8 % on land).

Indirect Taxation. More than half of the income of the state was derived from indirect taxation, and it is possible that the control exercised by the International Finance Commission over certain monopolies and customs duties has tended to perpetuate the dominant importance of consumption taxes in the fiscal structure.

Import duties were the most remunerative category in the tax schedule. In 1936, goods subject to duties were divided into twenty-four classes, with two rates for each class. The higher rate was applied to goods imported from countries with which special commercial treaties were not in force. The government also imposed export duties on certain articles.

The next most productive tax was provided by the excise on tobacco. The rates in 1940, based on grade and quality, ranged from 40–384 drachmae per kg. on snuff, cigarettes, cigars and pipe tobacco.

Monopolies. The government received substantial amounts of revenue from a number of state-operated monopolies, and this in effect amounts to a form of indirect taxation. The commodities so affected included salt, matches, emery, cigarette paper, playing cards and crude petroleum, which were administered by the International Finance Commission, and saccharine, quinine and narcotics, which were primarily for the control of the trade rather than for revenue.

Assessment and Collection of Taxes

In 1934, the income tax was administered by two agencies: the rating authorities who ascertained the amount of the tax, and the Treasurer's offices which had the duty of tax collection. The income tax on salaries and wages was collected at source, and was paid annually by the employer. All other forms of income tax were negotiated by individual yearly declarations, and payment was made in four annual instalments. The local rating officer had very wide powers for obtaining information about incomes, having authority to ask for information or documents from the taxpayer, central or local authorities, syndicates, banks, corporations and the stock exchange. He was frequently assisted in this work by a rating committee.

Penalties for detected tax evasion usually took the form of fines,

or increases of anything up to 75 % of the taxes due and not paid. These administrative penalties were usually leniently imposed, but in addition penal sanctions could be incurred.

The National Debt

In 1938 the per capita debt of Greece was £21, as against £12 for Roumania, £11 for Hungary, £8·5 for Bulgaria, and £8 for Jugoslavia. This heavy burden has its origin in the establishment of independence over 100 years ago, when loans to help the struggling nation during the War of Independence and to assist in reconstruction afterwards were granted by foreign powers. Before 1912 practically all debts contracted were for war purposes, apart from a few loans for railway construction. The Balkan wars and the war of 1914–18 greatly increased the debt of the country and immediately afterwards the settlement of refugees necessitated more heavy loans. Thus, apart from expenditure on public works, which occupies but a small fraction of the total debts, Greece has little material benefit to set against such a pressing financial burden.

Foreign indebtedness rose from 840 million gold francs in 1912 to 1,650 million gold francs in 1923; domestic debt during the same period leaped from 200 million dr. to more than 8,300 million dr. Then came the urgent need to finance the settlement of refugees and the work of national reconstruction. An initial advance of £1,000,000 was made by the Bank of England in August 1923, and later, with the approval of the League of Nations, an international 7% loan of £12,300,000 was issued (December 1924)—£7,500,000 in London, £2,500,000 in Athens and £2,300,000 in New York. Early in 1928, further loans of £9,000,000 (some at 6 %, some at 4 %) were made to the Greek government

These loans increased the government's foreign debt to 2,200 million gold francs in 1928, or about 350 gold francs per head of the population. The interest payments on this debt amounted in some years to 40 % of the total value of Greek exports, and the payments were therefore very dependant on the maintenance of a high level of remittances of foreign currency by Greek emigrants. These remittances had declined significantly before the world depression came to Greece in 1932 and manifested itself in serious currency difficulties (see p. 166).

The Greek government defaulted on its obligations in April 1932, and since that time there have been many negotiations with the

bond-holders. An arrangement concluded in November 1933 stipulated that Greece was to pay 27% of the interest on sterling and dollar debts in 1933–4 and 35% in 1934–5. Treasury bills for the unpaid balance were deposited with the International Finance Commission and provision was made in the budget for the full interest pending the release of balances becoming free under the agreement. In July 1936, a further temporary arrangement was proposed for 1936 and 1937–8, and bond-holders were advised to accept the Government's offer of 40% of the interest for these years. In July 1937, negotiations which had been in progress for a definite settlement finally broke down owing to the bond-holders' refusal to accept the Greek offer of 50%, which it was asserted represented the maximum paying capacity of the country. The Government, however, continued to pay 40% of the interest outstanding to those bond-holders willing to accept it as full payment.

On 31 March 1937, the public debt of Greece stood as follows:

	Millions of drachmae
Debts in foreign currency	61,413
Treasury Bills for unpaid foreign debt	5,131
Total foreign debt	66,544
Drachmae debt	11,179
Floating and miscellaneous debt	2,127
Grand total	79,850

Source: D O.T. *Report on Economic and Commercial Conditions in Greece*, 1938, p. 4 (London, 1938).

Over 80% of this debt was external, although one-third of the external debt was held in Greece. Over 50% of the external consolidated debt was made up of gold francs, while about 25% of the external debt was owed in sterling.

Financial Institutions

The Greeks have always shown a remarkable aptitude in banking and monetary transactions. Under Turkish rule Greek merchants acted as bankers throughout the Turkish empire and particularly at Constantinople. With the winning of national freedom, modern banking commenced.

The first banks operating in modern Greece were the Ionian Bank, founded in 1838 with British capital and having its head office in London, and the National Bank of Greece, established in 1841 at Athens by the Greek government with the aid of Greek, French, Swiss and German capital. The National Bank soon became a purely Greek institution, and up to the time of the reorganization of the Greek banking system in 1927–9, it was the central bank of the country, being the main bank of note issue. Other banking institutions were established as commercial activity expanded, and particularly between the years 1890–1910. Of special interest are the Bank of Athens founded with French capital in 1893, the Bank of the Orient founded in 1904 under the auspices of the National Bank and backed by German capital, the People's Bank established in 1905 as the first Greek Savings Bank, and the Commercial Bank of Greece which was constituted in 1908 with the help of British and French capital. The reorganization of the central banking system was carried through at the request of the League of Nations as part of the general plan to stabilize the Greek currency (see p. 166).

The Bank of Greece is paramount in Greek banking, but there are, in addition, twenty-seven commercial banks of varying importance. Between them, these twenty-seven banks held deposits in 1939 amounting to 17,000 million dr., over 60 % of which were held by the National Bank of Greece These banks are subject to the statute 5076 of 1931, which codified and amended earlier banking laws. They had to be organized in corporate form and were not permitted to transact any other than banking business. They combined the functions of commercial and investment banks, but concentrated in practice upon short-term advances, largely against trade bills, rather than upon the long-term financing of industry. The use of cheques was very limited, being confined to a small number of business men and wealthy individuals.

The banks deposited their surplus funds either with the Bank of Greece—which was not permitted to pay any interest on them—or with other banks, particularly the Agricultural Bank, which paid up to 3 % for those deposits. The money market was subject to strong seasonal variations, demand for money rising with the beginning of the harvest season and falling off in mid-winter.

In August 1939, the savings deposits in all Greek financial institutions amounted to about 9,600 million dr. Of this sum, 2,600 million were deposited with the National Bank, 2,500 million with other commercial banks, 600 million with the Agricultural Bank, 3,700

million with the Postal Savings Bank and the remainder with a multitude of small organizations. The work of the Agricultural Bank is discussed on pp. 182–91.

The Bank of Greece

On 14 May 1928, the National Bank transferred its note-issue privilege as well as all assets and liabilities related to its central banking functions to a new institution, the Bank of Greece. This new bank became the only authority permitted to issue paper money.

The Bank was organized in corporate form with a share capital of 400 million dr., divided into 80,000 shares of 5,000 dr. each. The government itself was bound not to acquire more than 10% of the share capital. Shareholders' meetings were held annually, but the general administration of the Bank's activities was in the hands of a Board of Directors, consisting of a Governor, a Deputy-Governor, a Sub-Governor, and nine Directors, the first three of whom were appointed by the government as full-time officials. The Governor, the Deputy-Governor, the Sub-Governor, the Secretary General, and the departmental managers formed the Board of Management which supervised the daily procedure of the Bank, and formulated the reports to the Board of Directors. A government commissioner had the right to attend all meetings of the shareholders and directors and to veto all decisions contrary to law. The Bank was required to publish weekly and yearly statements of its business and accounts. The members of the staff were appointed as a result of competitive examinations.

The Bank had its head office in Athens and branches in the following towns: Agrínion, Dráma, Flórina, Ioánnina, Iráklion, Kalámai, Kaválla, Kérkira, Khaniá, Lamía, Lárisa, Mitilíni, Pátrai, Piraiévs, Pírgos, Sérrai, Thessaloníki, Trípolis, Vathí (Sámos), Vólos, and Xánthi.

The first duty of the Bank was to exercise its privilege of issuing bank-notes. This privilege was guaranteed by Charter until 1960. Originally, the Bank had to maintain reserves adequate to convert all its notes into foreign gold-standard currencies, but these provisions were suspended in April 1932 (see p. 167)

The second function of the Bank was to act as banker for the Greek government. This work was complicated by the existence of the International Finance Commission (see p. 165) and of the League of Nations Protocol of 1927 which provided for the concentration in the Bank of all government receipts and expenditures.

The government was bound to keep all its cash balances and accounts with the Bank The Bank was also entrusted with the management of the entire domestic government debt as distinguished from the foreign debt managed by the International Finance Commission.

The third main form of activity was to support the commercial banks by granting credits to them as well as to commercial and agricultural borrowers. The Bank was empowered to discount, purchase and sell commercial and agricultural bills with three and nine months maturity limits respectively.

In addition to these main functions the Bank was entitled to buy and sell gold; to accept money in deposit accounts; to buy and to sell foreign currencies stabilized in relation to gold; to act as the agent of other banks; to accept custody of money and valuables and to co-operate with other Central Banks and the Bank for International Settlements.

The Bank was specifically prohibited to issue notes of 20 dr. or less; to engage in trade or have any interest in commercial or industrial undertakings; to acquire real estate except for its own use; to permit the renewal of maturing bills without a special resolution of the Directors; to grant unsecured advances of any kind, or to extend discount facilities to any customer other than the government to a total of more than 10 % of the Banks' share capital.

The shareholders were entitled to a maximum dividend of 8 % per annum—any further profits were divided between the General Reserve Fund and the government, which had to devote its share to the reduction of its debt to the Bank.

Important new functions accrued to the Bank when exchange restrictions were imposed after 1931. The Bank alone was authorized to deal in foreign currencies and to decide which commercial banks might be permitted to act as its agents or to keep foreign exchange for their own needs. In addition the Bank acted as banker under the clearing agreements concluded by the government with most other countries.

Position in 1938–9. The income of the Bank amounted to 358 million dr. in 1938, and to 384 million in 1939; it consisted mainly of interest payment on advances, investments and the government debt. Administrative expenses amounted to 173 million dr. in 1938, and 190 million in 1939; amortizations of all kinds, including part of the loss from the depreciation of the pound sterling in 1931 (see p 166), required 53 million dr. in 1938, and 89 million in 1939. Contributions to assistance and retirement funds for the staff came to

15 million dr. in 1938, and 16 million in 1939 Out of the net profit (116 million dr. in 1938, and 89 million in 1939), the statutory maximum dividend of 8% was paid, the share of the government was fixed at 39 million dr. in 1938, and 26 million dr. in 1939, and the remainder, 45 million dr. in 1938 and 31 million in 1939, was allocated to the Reserve Fund.

The note circulation had increased by 462 million dr. during 1938, and the rise continued during 1939 until a peak of 10,639 million dr. was reached in September of that year.

The National Bank of Greece

The National Bank became nominally an ordinary commercial bank after its central banking functions were taken over in 1928 by the Bank of Greece, but it continued to play a particularly important part in the financial life of Greece on account of its size and also because of its continuing semi-public character. The close connexion between the government and the Bank did not end when the latter ceased to act as the central bank of Greece. The Agricultural Bank was established by the government with the material support of the National Bank (see p. 186). In return for this assistance, the government agreed to compel all public bodies—with the exception of the Treasury, whose banker was the Bank of Greece—to deposit their liquid funds with the National Bank. The Bank was also entrusted with the financial management of the 'Currant Administration', which had the statutory power to regulate the marketing and especially the export of currants. An officer of the National Bank was a member of the statutory commission supervising the fulfilment of reserve requirements by the other commercial banks.

After 1929, when the National Mortgage Bank and the Agricultural Bank had been established in order to take over the functions of the Bank in the spheres of real estate and agricultural credit, the Bank engaged in the ordinary activities of a commercial bank, combined with limited investment activities and the acceptance of savings deposits. It had always been the most important Greek financial institution, but its size was still further increased by the absorption of the Bank of Kriti in 1919, and the Bank of the Orient in 1932.

The Bank had its head office in Athens and ninety branches covering all the important Greek towns. The Bank was the sole owner of the National Mortgage Bank of Greece and of the Hellenic Bank Trust Company in New York. After the outbreak of war in 1939 this latter was sold to Greek-American interests.

The Ionian and the People's Bank

The second largest commercial banking enterprise was the combination of the Ionian Bank and the People's Bank The Ionian Bank had purchased about 20 % of the shares of the People's Bank in 1937, and proceeded with plans for a complete merger. Although this had not been accomplished in 1939, the head management of these two banks had become identical The Ionian Bank is partly a British concern, with principal offices in London, Athens, Alexandria and Cyprus. The main field of activity, however, was in Greece. Both institutions were profitable, the Ionian Bank distributed on its capital of £600,000 dividends of 2½ % for 1938 and 3 % for 1939, and the People's Bank on its capital of 15 million dr. declared dividends of 39 % for 1938 and 31½ % for 1939.

The Bank of Athens

This bank was established in 1893 and became the second largest single commercial bank in Greece The head office of the bank was in Athens, with 120 branches throughout Greece, and three branches in Egypt and two branches in Cyprus. In addition it had an office in London and owned the Bank of Athens Trust Company in New York. It conducted a trust department, and through a subsidiary, a safe deposit business.

The Commercial Bank of Greece

This bank was founded in 1908 by Hambros Bank, London, in conjunction with the Greek family of Empedocles. In recent years the National Bank of Greece had acquired a minority interest of about 10 % of the shares and Greek influence had become predominant. The bank had its head office in Athens, with thirty-six other branch offices in Greece. Its capital amounted to £200,000 and its total assets stood at £832,000 in 1939.

Foreign Commercial Banks

The *Banca Commerciale Italiana e Greca* was founded in 1929 by the *Banca Commerciale Italiana* (Milan), the largest Italian Bank. Its head office was in Athens, with branches in Piraiévs and Thessaloníki. The management was in the hands of the Milan administration, which was closely connected with the Fascist government of Italy.

The Bank of Thessaloníki was established in 1888, when Thessaloníki was still part of the Turkish empire, with the co-operation of French and Austrian capital. It became one of the largest banks in Turkey, and when Thessaloníki was ceded to Greece after the Balkan wars, the bank transferred its head office to İstanbul, but maintained its Greek branches in Athens and Thessaloníki. After the war of 1914–18, the Austrian holdings were sold, and in 1939 the bank was dominated by the *Crédit Foncier de France.* Its profits were small and it did not distribute any dividends after 1930.

The British-French Discount Bank of London had branches in Athens and Piraiévs. It was mainly concerned with accepting and discounting trade bills. Since the decline in foreign trade after 1929 its business had not been profitable enough to warrant the distribution of dividends.

The American Express Company of New York has maintained a branch in Athens since 1921. It handled a considerable amount of Greek-American emigrants' remittances, and also carried accounts of the most important American business enterprises in Greece. It financed a considerable part of Greek exports to and imports from the United States. The branch was liquidated in 1941, immediately after the German invasion.

The Ottoman Bank of İstanbul had a branch in Thessaloníki.

Other Commercial Banks

The law of Greece stipulated that a banking enterprise had to be a limited company in order to be able to accept deposits or use the word 'banker' in connexion with its business. For this reason, there are many small commercial banks which undertake those functions normally connected with private banks in Great Britain.

The Bank of Piraiévs was the most important of these smaller banks. It was controlled by a group of Greek shipowners and paper manufacturers. Its head office was in Piraiévs and it maintained a branch at Athens. The Bank had regularly distributed 5% dividends on its share capital of 10 million dr. up to 1938, but it did not pay any dividend in 1939, presumably because the outbreak of war had interfered with its main business, the discounting of foreign bills.

The Greek Commercial Credit Bank resulted from the merger in 1924 of an important provincial bank, the Bank of Kalámai, with a firm of private bankers in Athens Its main office was in Athens, with branches in Kalámai and five other towns. The Bank regularly distributed a dividend of 6% on its capital of 15 million dr.

The Bank V. Caravassilis was another institution which was the successor of an important firm of private bankers. It was controlled by a family prominent in the tobacco industry, and it was mainly concerned in financing the family enterprises. Its office was in Athens. In 1938 it paid a dividend of 7% on its capital of 15 million dr.

Other small banks founded in recent years were the *Bank of Khíos* in 1919, the *Bank of Lakonía* in 1926, the *Bank of Amar* in 1920, the *Bank Union of Thessaloníki* in 1917, the *Bank of Attikí* in 1925. In addition there were the banking department of the *Mutual Savings Bank of the Army*, and the *Bank Theodossopoulos*, the *Bank of Pantelides*, the *Bank Georgiades*, the *Bank of Lárisa*, the *Bank of Véroia*, the *Bank of Kríti*, the *Bank Crokou-Moselli*, and the banking firm of *Kossa Brothers*.

The National Mortgage Bank of Greece

This institution was founded in 1927 by the National Bank of Greece in order to take over the mortgage credit functions of that bank. In 1939 it held about 70% of the Greek mortage business. The National Bank owned all the capital of the National Mortgage Bank and controlled its administration. The Bank had its head office in Athens, but did not maintain any branches since the branches of the National Bank functioned also as the agencies of the Mortgage Bank. The Bank granted two different kinds of loans: to individuals on mortgages upon urban or agricultural property, and to public bodies on mortgages or the pledge of revenues. The maturity of the loans varied from a few months to more than 25 years; loans with long maturities being repaid by annuities which amortized the capital year by year.

In 1937, the Bank was authorized by a special statute to provide mercantile shipping credit, but no business was commenced before the outbreak of war.

A very high proportion of the loans were secured by urban property and by 1938 only some 3% were concerned with agricultural land. The Bank regularly paid a dividend of 4% on its share capital of 80 million dr.

The Franco-Hellenic Mortgage Bank

This was the only other bank mainly engaged in mortgage credit. It was founded in 1931 by the Bank of Athens. It never attained a

very great measure of importance, but regularly succeeded in paying a dividend of 5% on its share capital of 50 million dr.

The Postal Savings Bank

After the Bank of Greece, the National Bank, and the Agricultural Bank, by far the largest financial institution was the Postal Savings Bank. It was entirely owned, and its liabilities guaranteed, by the government. Residents of Greek towns too small to have a branch of one of the commercial banks found the most convenient deposit for their savings in the postal savings system. The Bank did not accept any other than savings deposits, and its funds were mainly invested in loans to the government and other public bodies. In 1938, the amount of new deposits was 2,600 million dr., the amount of repayments 2,300 million dr.

Other Savings Institutions

These included the various 'mutual funds' maintained by public employees and members of professions for the purposes of retirement pensions and social insurance generally. The largest of these institutions were the *Mutual Savings Bank of Civil Employees*, the *Mutual Savings Bank of the Army*, the *Institute of Social Insurance*, the *Mutual Savings Bank of the Navy*, the *Office of the Port of Piraiévs*, the *School of Engineering*, those of two hospitals, and the *Retirement Fund of Lawyers*. The funds of all these institutions were invested in much the same way as those of the Postal Savings Bank.

The Stock Exchange

The only Greek stock exchange was located in Athens. It was founded in 1876 by Royal decree, but in recent years its constitution was based upon an Act of 1919 and its amendments. Its members were brokers, whose numbers were limited to twenty-five, and agents who acted as intermediaries between the brokers and their clients. The members were appointed by the government upon approval by the Stock Exchange Committee. Membership could only be sold by permission of the Committee, and a broker had to deposit with the National Bank a quarter of a million drachmae as a guarantee of his solvency, and an agent likewise 50,000 dr. Stocks and bonds were traded both for immediate (spot) and future (forward) payment. Dealings in foreign exchange ceased in 1932.

In 1939, the securities listed on the stock exchange included 27

issues of Government bonds (valued in the market at 17,000 million dr.), 13 issues of bank and industrial bonds and 68 issues of companies' shares. Among the latter by far the most important group were bank shares (8 issues valued at 2,300 million dr.), followed by shares of companies engaged in the chemical industry, the textile industry, transport, the foodstuff industry, and construction.

The stock exchange was closed from October to December 1940, and then again after the German occupation in April 1941.

Insurance

The insurance business had not reached a very advanced stage of development in Greece. Most policies were either written or reinsured by foreign companies—particularly British and Italian. In 1939, only five of the eighteen licensed domestic companies were engaged in life insurance. Fourteen companies undertook fire insurance and ten wrote marine policies. The total share capital of the eighteen Greek companies was only 93 million dr. Operations of insurance companies in Greece were regulated by the Private Insurance Companies Law No. 1023 of 2 November 1917, which has since been amended by a large number of decrees, the most important of which, Law No. 2161 of 13 December 1939, made provision for the establishment of a Reinsurance Institute of Greece with which all insurance companies operating in Greece had to reinsure 50% of all insurance and reinsurance transactions, except those of marine policies.

Government control of the private insurance business was very pronounced, and companies had to submit their premium rates to the Institute for the approval of the Minister of National Economy.

Marine insurance was of great importance for the Greek economy, but lay almost entirely in the hands of British companies.

Agricultural Finance

The Agricultural Bank of Greece was founded in 1929 and in its short history the Bank has done the nation a great service. By the end of 1928 the country had just managed to resume ordinary parliamentarian life, after having passed through the most difficult period of its modern history (1912–26). Of all its trials, the most exacting had been the absorption of more than a million refugees. During that period, too, the agrarian reform laws (1914–26) gave

ownership to peasants, but land reform which gives the peasant land only, and little or nothing else, does not solve agrarian problems. It is true that there was progress apart from the land reforms. Co-operative societies had been formed and for the first time in the history of the country agriculturists were at work in many parts of Greece, advising, experimenting, and in general improving the standards of farming.

Yet all this modernization did not improve the well-being of the individual farmer, who lived a hand-to-mouth existence, possessed very few or no savings, and was forced to sell a piece of his land whenever a court case, illness, or the necessity to provide a dowry —a universally binding obligation for Greeks—placed an extra strain on his meagre resources. Although the Exchequer took no direct taxes from the farmer the form of indirect taxation was such that it absorbed his earnings quite ruthlessly, and, by reason of its parity, fell unfairly on the poorest people. Moreover, the absence of the men-folk in the army for some ten years, the failure of crops, the unbalancing of prices through the exploitation by merchants, the rise in the cost of living in the post-war period, and, worst of all, the unscrupulousness of the money-lenders, had plunged the peasants into debt.

In rural districts the money-lender was usually either the local grocer, or a merchant of the market-town. His hold over the peasants was all-embracing. In the winter months he sustained them with loans in money or in kind; sometimes he supplied them with their seeds; he bought up their harvests; he would finance them in a court case—and so forth. For all these services the peasant paid back tenfold, as the money-lender overcharged for the goods (mainly foodstuffs) from his shop, and for the seeds, while he paid the lowest possible price for the peasant's produce. The peasant was at his mercy, and no written documents were exchanged for any transaction except for loans in cash. It was, of course, open to a peasant to repudiate a debt, but that would have meant the end of credit and a gloomy prospect for the winter. On the other hand, a peasant who had the courage to invoke the law against exorbitant terms of interest had no real evidence to produce.

For peasants of the more prosperous class, the conditions, though different, had the same result. They were looked after by the money-lending departments of the commercial banks. Before the introduction of laws limiting rates of interest, the money-lenders were free to charge at any rate of interest, and cases are recorded

where the price of two cwt. of seed was paid for, two or three years later, with the very field on which it had been sown. After the rate of interest had been fixed at 11% *per annum* (actually 12%, since it was paid in advance), the money-lenders kept on the right side of the law by giving the farmer less money than was carried on his note-of-hand. The difference between what the farmer got and what he signed for was in direct ratio to his financial difficulties. The commercial banks did not exceed the legal rate of interest; but in contracting a loan from one of them, the farmer was subjected to so much scrutiny, such delays, so many papers to sign, so much for a notary's fees, stamps, and the like, that he invariably preferred the simpler methods of the money-lender. The commercial banks, nevertheless, made their profits indirectly, since the money-lender was the client of some bank or other, and paid interest on the capital he borrowed from the bank.

Marketing was in an even worse state than the financing. The produce was bought up at low prices by the merchants' local agents or by other individual traders, and was resold to larger combines and directed to the consumer through further channels, until the price paid by the consumer had no relation whatever to that paid to the producer. Almost the same principles applied to exported produce (tobacco, currants, olive oil, fruit, etc.), though here the fluctuations of prices abroad had graver repercussions on the national economy.

The problem of marketing agricultural produce was largely solved by the growth of the co-operative movement, and the poverty of the peasant classes was fought by the abolition of debt and the foundation of the Agricultural Bank.

The Co-operative Movement

The first peasant co-operative society in Greece in modern times was formed in 1910, at Almirós, by a local schoolmaster named Michopoulos. His example was widely followed, and in 1914 the state offered its legal aid and protection to the movement, which it then re-started on a new and sounder basis. Civil servants—officials of the Ministry of Agriculture—were appointed to direct the societies within their jurisdiction, to audit their accounts, and to spread the movement, helping newly established societies to obtain their recognition in correct legal form.

When the Agricultural Bank was established in 1929 it took over the supervision of the co-operative societies from the Ministry. The

whole staff, inspectors and supervisors, were transferred smoothly and swiftly, and the work continued almost without interruption The Bank set up a special department—one of its four main departments (see p. 188)—for this work. Thereupon, the co-operative movement took new life and force. The position at the end of 1933 (four years after the founding of the Agricultural Bank) is summarized in the following table. The beginning of 1935 saw the establishment at Athens of the Panhellenic Confederation of Agricultural Co-operative Societies, the final step in the movement that began with the village society.

Active Co-operative Societies in 1933

Category	Number of Societies	Membership 31/12/33	Number of shares 31/12/33	Value of shares 1,000 dr	Co-operative capital 1,000 dr	Property 1,000 dr.
Credit	3,150	208,156	301,081	193,675	102,570	67,295
Provisioning	19	1,621	4,777	1,166	522	1,173
Marketing	272	16,517	33,002	15,686	9,952	7,806
Productive	169	13,251	72,903	34,430	5,526	42,126
Various	128	20,730	20,832	4,257	8,105	15,833
Total	3,738	260,635	432,595	249,214	126,675	134,233

Source *Annual Report of the Agricultural Bank of Greece*, 1935 (Athens, 1936).

The co-operative movement has simplified, extended and lowered the cost of obtaining credit, and at the same time it has improved the peasant's knowledge of credit and farming methods. More detailed and specific achievements are:

(1) The concentration of wheat production on behalf of the Central Committee for the Protection of Greek Wheat.

(2) The establishment of rural industries.

(3) The collective exploitation of forests, pastures, etc.

(4) Drainage and irrigation works on a collective basis.

(5) The marketing and export of agricultural produce.

(6) The provisioning of members through their own co-operative stores.

(7) The propagation of better farming by means of lectures and pamphlets; the introduction of better seeds and breeds of livestock; the holding of agricultural shows.

Under the Metaxas régime the Co-operative Department of the Agricultural Bank was dissolved; some of the staff were persuaded

to join the new Ministry which was formed on the model of the Italian Fascist Syndicalist Organization. This reorganization was against the wishes of the majority of the societies, but they could not do otherwise than conform. At the end of 1938 the number of agricultural credit co-operatives stood at 4,529, in addition to more than 2,000 agricultural organizations for co-operative production, purchase of machinery and new materials, marketing, land improvement, forestry and the like.

The Abolition of Peasant Debts

In spite of land reforms, the growth of the co-operative movement, and other protective measures of the state, the peasant himself was crippled economically. It was estimated in 1934 that the debts of the one million peasant families of Greece amounted to some ten thousand million drachmae—at the rate of exchange then, some twenty million pounds sterling, or an average of five pounds per head of the rural population.

Venizelos had drafted legislation for the abolition of agricultural debt, but it was Metaxas in 1937 who put it into force. The main provisions were:

(1) It embraced as beneficiaries all peasants (i.e. those who work in the field or as resident managers).

(2) All outstanding debts owed to individuals, on which more interest had been paid than the original sum carried on the bill of exchange, were abolished.

(3) If the interest which had been paid was less than the original sum, then the difference was to be paid by the debtor, except in cases of extreme poverty.

(4) Where no documents or receipts were available, oral testimony, duly supported by reliable witnesses, was to be accepted as valid.

The measure provoked much criticism, and there was, admittedly, some injustice. Some beneficiaries were not strictly peasants, but cases of individual hardship were counterbalanced by the improvement in the general welfare.

The Agricultural Bank of Greece

The Agricultural Bank was not the first instrument of agricultural credit, for in 1915 the state and the National Bank of Greece had made an agreement, by which the National Bank undertook to provide loans to the peasants up to a total of twenty-five million

drachmae (the equivalent then of £1,000,000). Wishing to extend credit on a large scale, the government (with the help of the National Bank) founded the Agricultural Bank in 1929. The guiding principles in the conduct of the bank were:

(*a*) Productive investment in any farming enterprise; guidance of the farmers towards a fuller exploitation of their holdings; the formation of a more rational agricultural economy.

(*b*) The supervision, guidance and development of the co-operative societies and the propagation of the co-operative movement with an advancement to wider fields of social and economic activity.

(*c*) The agricultural-economic surveying of the country, with the object of helping, through the Bank, to open new channels of production and to increase existing productive capacity.

(*d*) Expanding and encouraging the consumption of agricultural commodities, both at home and abroad, and the protection of prices by the various means at the Bank's disposal.

The capital was derived primarily from the government and the National Bank, as shown below:

	Million dr.
State grants	950
Peasants' contributions	20
Credits from National Bank of Greece	850
Miscellaneous sources	130
Total capital	1,950

This represents, at the rate of exchange then ruling, a capital of roughly £5 million. From its very first years, the Bank has made great efforts to shake off the burden of the 850 million dr. representing the credits from the National Bank, for which interest was charged at a rate rather heavy for a bank engaged in agricultural financing.

Administration. A special statute regulated the administration of the Bank. There was to be a Committee of Supervision, consisting of the Vice-President of the Supreme Court as chairman with two high government officials as members; and also an Administrative Council to deal with problems of management. The real administrative power was in the hands of the governor and the sub-governor who were members of the Administrative Council. The Bank had its main office in Athens, and in 1939 there were thirty-nine branches in the leading Greek towns and seventy-six agencies in smaller places. Apart from these, credit co-operatives often acted as agencies of the Bank.

The work of the Bank was divided among four departments covering agricultural credit, technical direction, co-operative service, and research and secretariat.

The department of agricultural credit was staffed by officials drawn from the National Bank and the commercial banks, with a few co-operative supervisors and agriculturists of banking experience. The function of this department was to deal with all matters of short-term loans, loans on security, 'unsecured'* loans on tobacco, currants, etc. These men naturally viewed their new work in the light of their former banking experience. To them, a client was worth in credit just as much as he could safely repay at the appointed time. Moreover, they demanded on the bills the co-signatures of two trustworthy householders. Thus, a cautious note was sounded from the start, and many poor peasants who had supposed, when the Bank was founded, that money was theirs for the asking, were sadly disappointed.

The department of technical direction was staffed by agriculturists who usually lacked any banking experience. It was they who, counter to the opinion of the bankers in the department of agricultural credit, urged considerable expansion of credit facilities. The result of these conflicting tendencies within the Bank was that a satisfactory provision of credit was granted, without risk of large-scale default. The function of this department was primarily to deal with long-term loans, research, factories, drainage, etc.

The department of co-operative service also was staffed by men familiar with Greek agriculture. Their duties (until disbanded by Metaxas in 1937) were to inspect and supervise the work of the co-operative societies and their unions, thereby facilitating the collection of members' debts and subsequent repayment to the Bank.

The department of research and secretariat was responsible for all secretarial work, agricultural insurance, statistics and research, and for the collection of refugees' debts. These debts were incurred in the settlement of refugees and amounted in 1935 to 118 million dr. The bulk (about 100 million dr) was owed by refugees living in rural areas and represents repayments on the value of their land, housing, agricultural implements and the like (see vol. I, p. 392 of this Handbook).

In 1933 a special section was created for the distribution and supply of agricultural produce. Among its many achievements, it

* The Greeks call loans made on an intangible security, such as an expected crop, 'plasmatic' loans.

was responsible for the purchase of refrigerator wagons for the carriage of fresh fruit and vegetables to Central Europe. The produce sold to Germany, Austria, Poland and Czechoslovakia consisted chiefly of grapes, citrus fruit and spinach. Produce was also distributed throughout the mountain regions on behalf of the state, and fungicides and insecticides were imported and distributed. The work of this section is leading to the elimination of the middle-man, to sound marketing and to price-control.

Credit. The Bank granted four main kinds of credit, according to the period of the loan or the nature of the security. By far the most general, and forming the greater part of the Bank's loans, are those based on personal security. They are used to sustain the peasant families during the winter and to finance the planting of grain, grapes, tobacco, olives and cotton, and the raising of cattle. Such loans are made, either in one single sum, or, more often, in two or more instalments. In recent years the Bank adopted the practice of giving part of the loan in kind (seeds and fertilizers), which had the advantage of ensuring that fertilizers of particular types were used (see p. 127). At the end of 1939 these loans amounted to 2,000 million dr., and during that year more than 2,200 million dr. had been advanced and 1,900 million dr. repaid. Forty per cent of the advances made in 1939 were on grains, the cultivation of which was promoted by the government as a part of its self-sufficiency programme (see p. 53); another 25% were on grapes, and only 10% on tobacco—the main export crop. Advances in kind (fertilizers, seeds, pest-destroyers) were valued at 485 million dr. About 350 million dr. of the debt at the end of the year was overdue, but most of these arrears were constantly being reduced so that only 200 million dr. had been outstanding for over two years. Of approximately 250,000 people who received help in this way (representing 25% of the peasant population) some 60% were members of the co-operative movement.

The second main type of loan was based on the security of the harvested produce stored in the owners' or the co-operative society's premises, or in those of the Bank. Such loans do not usually exceed in amount one-third of a modestly estimated valuation of the produce, and their object is to protect prices. They are repaid at short date. This type of loan has been of very great assistance to the peasant farmer, enabling him to hold on to his crop until a fair price can be obtained for it, and they have contributed greatly to the economic emancipation of the peasant. At the end of 1939, the total of these

loans in existence came to 1,000 million dr.; the advances during the course of the year totalled 1,700 million dr., and the repayments about the same amount. Forty-five per cent of the new advances concerned tobacco, 35% grain, and 12% grapes; the rest was distributed among olives, cotton, silk production, citrus fruits and minor crops. Almost 75% of the total was advanced to co-operative societies, the remainder to individual farmers.

Medium-term loans formed the third category and were used for the purchase of draught animals and tools. The purchase must be verified by receipts or certificates, and repayment is by three or four annual instalments. If the commodity for which they have been granted is not bought, they are called in at once.

Finally, long-term loans (repayment by four to twelve annual instalments) covered improvements of all kinds to farms and the holdings of co-operative societies, e.g. tractors, harvesters, pumping installations, houses or farm-buildings, co-operative factories, orchards, drainage and irrigation.

Together, these medium- and long-term loans are the most important type of credit, because they make for permanent improvement in Greek farming. The granting and application of the loans are under the direct and continuous supervision of the technical service of the Bank. Their objects range from a single draught-animal to a co-operatively-owned tractor or factory, and embrace all rural activities. Known and well-tried methods and means of production are promoted, and new ideas and methods are also introduced. The total of these loans was about 1,000 million dr. at the end of 1939, during which year new loans totalled more than 400 million dr. and repayments more than 200 million dr. Of the new loans 30% were made for investment in draught-animals—illustrating the lack of mechanization in Greek agriculture—about 20% for drainage and irrigation, and the rest for tools and machinery, erection of oil plants, dairies, drying plants for tobacco and raisins, etc. Nearly 39% of these loans were made to companies and organizations other than co-operatives; 32% to individual farmers, and 29% to co-operative members. About one-third of all applications for such credits had to be denied.

Apart from these main categories, forestry credits amounted to about 70 million dr., 40% on short term, 60% on long term. Almost the entire sum went to co-operatives or other organizations. The main purpose of these credits was to stimulate the production of resin, lumber and charcoal. Other credits were granted to the fishing

industry, to the storage of grain and other farm products, and to the marketing of cotton fibre and cotton seed.

The interest rates charged by the Bank varied from 5½% for secured short-term loans to 8½% for long-term loans. Co-operative societies paid 1% less than individual farmers. In case of default, the Bank tried to help the debtor rather than to sue him, and in 1938 legal action was taken in only eleven cases. The chief reasons for delay in repayment were damage to crops, the inherent uncertainty of such crops as currants and tobacco, and, in some cases, errors on the part of branches of the Bank or its agencies, i.e. branches of the National Bank of Greece which by agreement carried agricultural credit in localities where the Agricultural Bank had no branches. Repayments have been better in northern Greece as a whole than in southern Greece. The small percentage of delayed repayments is an indication of the sound policy of the Bank and the success of Greek agriculture in the years following its foundation. The initial opposition of the commercial banks was overcome by demonstrating that the Agricultural Bank, so far from being a rival, was in fact a major contributor to the financial well-being of the nation.

Conditions Since September, 1939

The Period of Greek Neutrality, September 1939–October 1940

The original budget estimates for the year 1939–40 were obsolete almost from the time when they were first announced. During the year the government was obliged to make unforeseen expenditures totalling 1,437 million dr., of which 1,167 million dr. were additional military appropriations. This amounted to a 10% increase over the original estimates, and it was largely met by new taxes, internal borrowing from semi-public pensions and saving funds (see p. 181), and more careful tax collection.

A moderate inflationary trend was well defined during this period. From July 1939 to October 1940 the bank-note circulation increased from 7,900 million to 11,600 million dr., the cost of living in Athens rose by 12%, and the wholesale price index by almost 20%. On the whole this period did not see any great distortion in the Greek economy, and any changes which came were largely due to the curtailment of the volume of international trade, coupled with an increased national expenditure on military and naval installations.

The Period of War in Greece, October 1940–May 1941

The Italian attack upon Greece in October 1940 interrupted the process of adjustment to the new conditions in a most violent way. The Greek economy was strained by the mobilization of all available man-power, by the disruption of all transport by land and sea, and by the warfare in Ípiros.

The government took stringent action—it prohibited withdrawals of more than 10,000 dr. per month from bank deposits except for amounts needed for business transactions, and it also closed the Athens Stock Exchange. All exports and imports were to be handled by government agencies or by compulsory trade associations.

The war costs were covered by financial aid given to the Greek government by the United Kingdom, by increased taxation, and by a war lottery which yielded 10 million dr a month. The financial support given by the British government consisted of loans totalling more than £20 million without any specific repayment terms. As imports were very restricted at that time, this potential purchasing power was not greatly used, but the government lodged it with the Bank of Greece in exchange for domestic currency which it proceeded to expend. The resultant increase in note circulation was accompanied by a decline in the production of consumers' goods as a result of war-time problems in manufacture and the shortage of basic raw materials. In consequence, the price level increased as rapidly as the note circulation, and by the spring of 1941, commodity prices had risen to levels varying from 50–150 % above the pre-war figure.

A further result of the inflation was that the point was rapidly approached where the price of the metal content of the 10 and 20 dr. coins (made of silver, copper, nickel and tin) would become higher than their face value. The contemplated exchange of these coins for nickel pieces had not taken place (see p. 164), so at the beginning of 1941 the government called them in and compelled holders to exchange them for bank-notes of the same denomination. The coins were melted down and sold for their bullion content.

The Period of Occupation, May 1941–December 1943

The disruptive effects of the war were far surpassed by those of Axis occupation. The value of the drachma has been completely undermined by the huge growth of public expenditures, in particular the costs of occupation paid to the German and Italian authorities.

During the early stages of the occupation, the Germans issued military notes denominated in Reichmarks and placed in circulation as legal tender at a fixed exchange rate of 60 dr. = 1 Rm. It was estimated that by the summer of 1941 some 10 million Rm. or 600 million dr. were thus put into circulation In the Ionian Islands, annexed by Italy, a special issue of Italian currency (the Ionian lira) was introduced at the rate of 1 lira = 8 dr.

The rapid depreciation of the currency led to the hoarding of metal coins. In the summer of 1941 the 5 dr. nickel pieces were called in, and shortly afterwards all the subsidiary coins. The population was compelled to accept in exchange newly-issued bank-notes of 5, 2 and 1 dr., and even 50 lepta. By that time the depreciation of the currency had made such progress, however, that denominations below 10 dr. were hardly needed any more.

Early in 1943 the Germans began to pay their troops in Greece with another type of currency consisting of special Reichmark coins and notes worth ten times their face value when used in Army canteens. Part, or all, of the soldiers' pay was paid in this currency taken at its canteen value, with the result that the soldiers were forced to spend their money in the Army canteens This was an attempt to avoid the unfavourable economic and social results of free spending by the troops in an area where goods and services were in desperately short supply.

The remarkable depreciation in value of the Greek currency is attributable primarily to the vast expenditures of newly created money by the occupation forces. At the same time prices were forced upwards by the acute scarcity of goods caused by the severance of trade relations with the outside world, the breakdown of internal production and transportation, and the looting of the country by the Germans and Italians.

The degree of inflation varied from district to district, and also between the official markets and the black markets. Some indication of the extent of price increases is conveyed by the information that in May 1942, official prices of newspapers and tram fares stood ten times above the pre-war level, and of eggs at twenty times. In February 1943, the official price of bread was 200 dr. per oka, representing an increase of 2,500 % in three years.

Financial Position of the Greek Government in Exile

The revenue of the Greek government in London, and subsequently in Cairo, has largely been derived from Greek shipping

services. Both revenues and expenditures have been comparatively small. The Governor of the Bank of Greece, Mr K. Varvaressos, escaped with the government and managed to evacuate that part of the reserves in gold and foreign currency which was not already held in London and New York. The Bank in exile has acted as banker to the government, collecting its revenues and meeting its expenses.

Bibliographical Note

1. *The Annuaire statistique de la Grèce*, 1939 (Athènes, 1940) gives a statistical summary of Greek finances Much valuable information is contained in the *Report of the Agricultural Bank of Greece* (Athens, annually), the *Statistical Report of the Agricultural Co-operatives of Greece* (Athens, annually), and the *Yearly Economic Report on Greece* (Athens, annually), which is sponsored by the National Bank of Greece and edited by M. G Haritakis. The text of these works is in Greek.

2. Further information on agricultural finance, marketing and co-operatives can be obtained from the following books

S Iasemides, *The Agricultural Co-operatives* (Athens, 1924).
D. Kallitsounakis, *Co-operatives* (Athens, 1924)
Xen Zolotas, *State Planning for Agriculture* (Athens, 1930)
These are in Greek.
Two books in French, F. Boulanger, *Ambelakia, ou les Associations et les Municipalités Hellémques* (Paris, 1875) and A Voyadzoglou, *Contribution à l'économie rurale de la Grèce aprés la guerre* (Paris, 1928), provide further data

3. Much official information of considerable value is to be found in the *Reports of the 45th and 50th sessions of the Financial Committee of the League of Nations* (Geneva, 1933).

4. The Reports of the Department of Overseas Trade (see Bibliographical Note, p 141) give an account of the general financial conditions The Royal Institute of International Affairs prepared an economic account of the Balkan states which helps to relate the Greek economy to that of its neighbours—*The Balkan States*, vol. I, 'Economic', *A Review of the Economic and Financial Development of Albania, Bulgaria, Greece, Roumania, and Yugoslavia since* 1919 (London, 1936)

Branches of Major Banks in Greece

A Agricultural Bank of Greece
AE American Express Company
AT Bank of Attikí
BA Bank of Athens
BF British-French Discount Bank
CA Bank of Caravassílis
CC Greek Commercial Credit Bank
CG Commercial Bank of Greece
CH Bank of Khíos
FH Fanco-Hellenic Mortgage Bank
G Bank of Greece
I Ionian Bank
IG Banca Commerciale Italiana e Greca
LA Bank of Lakonía
N National Bank of Greece
NM National Mortgage Bank of Greece
PI Bank of Piraiévs
PO People's Bank
TA Bank of Thessaloníki

Town	Banks	Town	Banks
Agrínion	A BA CG G N	Lamía	A BA CG G N PO
Aíyion	A BA CG N PO	Langadhás	N
Alexandroúpolis	BA N I	Lárisa	A BA CG G N PO
Alivérion	BA	Leonídhion	BA
Amaliás	A BA CG N	Levádhia	A BA N
Ámfissa	BA N	Levkás	BA N
Ándros	N	Límni	BA
Árgos	A BA CG I	Límnos	I N
Árta	BA N	Mégara	I
Argostólion	BA CG G I N	Megalópolis	BA CC N
Atalándi	N	Mesolóngion	A BA N
Athens	A AE AT BA BF CA CC CG CH FH G I IG LA N NM PI PO TA	Messíni	A N
		Mílos	BA
		Mitilíni	A BA CG G I N
		Moláoi	BA CC LA
Ayía Paraskeví	BA	Náousa	BA I
Áyios Nikólaos	A BA N	Návpaktos	BA N
Dhidhimótikhon	A BA N	Návplion	BA CG I N
Dhimitsána	BA N	Náxos	CG
Dráma	A BA CG G N I	Néon Karlóvasi	CG BA N
Édhessa	N	Orestiás	BA N
Elassón	N	Pátrai	A BA CG G I N PO
Fársala	CG	Paxoí	N
Filiátes	BA	Pílos	BA N
Filiatrá	BA	Piraiévs	AT BA BF CC CG G I IG N PI PO
Flórina	BA CG G N		
Gargaliánoi	BA	Pírgos	A BA CG G N
Ierápetra	BA N	Plomárion	CG N
Ioánnina	A BA CG G N PO	Póros	N
Iráklion	A BA CG G I N PO	Potamós	A BA N
		Préveza	A BA CG N
Istiaía	BA N	Réthimnon	A BA CG G N
Itháki	BA N	Sérrai	A BA G N PO
Kalabáka	N	Sikionía	BA I N
Kalámai	BA CC CG G I N	Síros	BA CG
Kalávrita	BA N	Sitía	N
Kardhítsa	A CG N	Skíathos	N
Karpenísion	BA N	Souflíon	N
Kastoría	BA N	Spárti	BA CC I LA N
Kateríni	A BA N	Thessaloníki	A AT BA CG G I IG N PO TA
Kaválla	A BA CG G I N		
Kírkira	A BA CG G I N	Thíra	BA N
Khalkís	BA CG N	Thívai	A BA N
Khaniá	A BA CG G I N	Tríkkala	A BA CG N
Khíos	BA CG CH I N	Trípolis	A BA CC G I N
Kilkís	N	Vathí	A CG BA G N
Kími	BA N	Véroia	A BA N
Kiparissía	A BA N	Vólos	A BA CG G I N PO
Kíthira	BA N	Xánthi	A BA G I N
Komotiní	A BA N	Xilókastron	A BA
Kórinthos	BA N	Yíthion	BA LA N
Kozáni	A BA N	Zákinthos	BA CG I N

Chapter VII

MERCANTILE MARINE

Introduction State of the Mercantile Marine Shipping Companies and Services in 1939 State Aid to Shipping· Personnel Shipping Traffic· Freight Earnings Conditions since 1941: Bibliographical Note

Introduction

The sea has always been the natural means of communication between the peoples inhabiting the different coastal regions and islands of Greece. Most of the population lives near to the coast and the mountainous nature of the country has never permitted the development of adequate systems of land communication. The long, highly indented coastline, on the other hand, with its many sheltered gulfs, has favoured the development of coastal shipping, which plays an extremely important part in the economy of the mainland; in the case of the individual islands of the Aegean and Ionian Seas, sea routes provide the only means of communication Furthermore, the export of shipping services ('invisible exports') by the Greek mercantile marine is a great asset to the national income and in this respect it completely overshadows the merchant fleets of the other Balkan states. Greek vessels earn freights between all parts of the world, not only carrying a high percentage of the foreign trade of Greece but also playing a prominent rôle in the international carrying trade.

From the end of the eighteenth century until the middle of the nineteenth century, Greek sailing vessels were dominant in the trade of the Aegean and the Black Sea This activity partly resulted from a commercial treaty concluded between Russia and Turkey in 1783 which gave Greek ships the protection of the Russian flag. During this period the foundations of the great carrying trade were laid. Greek ships were used in blockade-running during the Napoleonic wars, and later the merchant fleet made a considerable contribution to the Greek cause in the War of Independence. The merchant fleet in 1821 consisted of some 600 large ships mostly built in Greece, but much of it was lost during the next ten years. New vessels were, however, soon constructed, and, by the beginning of the last quarter of the century, Greece had some five thousand sailing ships which

carried a high percentage of the trade of the Mediterranean and the Black Sea, while large ships traded to western Europe and South America.

The adoption of steam-driven vessels was rather a slow process, since, unlike sailing vessels, they could not be built in Greece. There were only twenty-seven steamers totalling 8,241 tons gross in

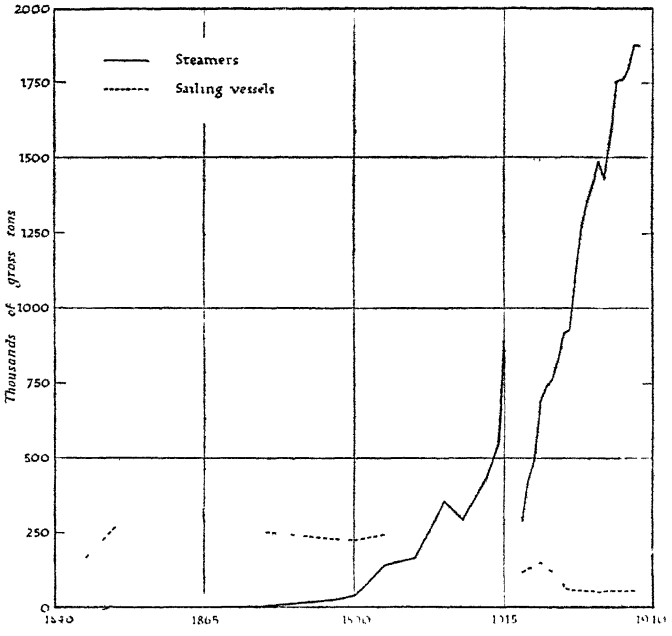


Fig 31. The development of the merchant fleet, 1840–1940—gross tonnage
Based on data from *Annuaire statistique de la Grèce*, 1939, p. 484 (Athènes, 1940)
There is a gap in the graph of tonnage of steamers between 1915 and 1918 owing to lack of records.

the Greek fleet in 1875, but by the end of the century the number had increased to 210 of 168,566 tons gross; some of these were now able to compete with foreign-owned steamships that had hitherto operated greatly to the disadvantage of Greek sailing craft. The Greek steam- and motor-driven fleet of vessels of over 100 tons gross increased from 214 vessels of 348,763 tons gross in 1905 to a peak total of 638 vessels aggregating 1,889,269 tons gross in 1938 (Fig. 31). Between these dates there was a steady annual increase, interrupted only by the war of 1914–18. Greece had the highest net shipping

losses of any nation during the war, for between June 1914 and June 1919 her fleet tonnage was reduced by 64·6%, compared with 36 8% for Germany, 18·4% for Norway, 18 1% for Denmark and 13 5% for Great Britain. These figures take into account the construction or purchase of ships, and Greece, in contrast to other countries which suffered losses, had few facilities for effecting replacements. During 1914–16 Greek ships were willing to take the risks involved in running the blockade against Turkey and Bulgaria; later in the war many of them were chartered to the Allies and helped to serve the Allied forces in Salonica, Egypt and elsewhere in the Mediterranean.

State of the Mercantile Marine

World Rank in 1939

In 1939, the merchant fleet of Greece ranked ninth in the world fleet of steamers and motor-ships above 100 tons gross; it consisted of 607 vessels totalling 1,780,666 tons gross, representing about 2·6% of the world total and 251 tons gross per thousand inhabitants. This may be compared with the figures for those countries having fleets larger than that of Greece; in tonnage per thousand inhabitants, Greece is only exceeded by Norway, the United Kingdom, the Netherlands and Denmark.

Country	No of vessels	Gross tons	Steamers, gross tons	Motor vessels, gross tons	Gross tons per 1,000 inhabitants
United Kingdom	6,722	17,891,134	13,294,286	4,596,848	311
U S A (sea-going)	2,345	8,909,892	8,194,553	715,339	68
Japan	2,337	5,629,845	4,100,882	1,528,963	78
Norway	1,987	4,833,813	1,824,289	3,009,524	1,655
Germany	2,459	4,482,662	3,306,778	1,175,884	66
Italy	1,227	3,424,804	2,709,020	715,784	79
Netherlands	1,523	2,969,578	1,619,233	1,350,345	340
France	1,231	2,933,933	2,497,799	436,134	70
Greece	607	1,780,666	1,761,314	19,352	251

Sources. (1) *Lloyd's Register of Shipping*, 1939–40, vol. III, Statistical Tables (London, 1939), (2) the final column is based on the 1938 population estimates in the *Statistical Yearbook of the League of Nations*, 1938–39, p 16 (Geneva, 1939).

Greek official statistics record a total of 607 steam vessels amounting to 1,873,700 tons gross in 1938, which shows a discrepancy from Lloyd's figure for 1938—638 vessels of 1,889,269 tons gross, though this latter figure probably includes some vessels classified by the

Greeks as sailing vessels, but which are greater than 100 tons gross. There were also 712 sailing vessels of 56,401 tons gross, including ships fitted with auxiliary motors. These statistics only refer to vessels with a net tonnage greater than 30 tons.

Composition of the Fleet

The 607 steamers recorded in Greek statistics for 1938 consisted of 512 cargo vessels of 1,814,955 tons gross, 74 passenger vessels of 55,251 tons gross, and 21 miscellaneous ships totalling 3,494 tons gross. Thus cargo ships represent some 97% of the merchant fleet, compared with 94% in 1933, when the balance was made up by passenger ships and a small percentage of trans-Atlantic vessels. In 1939, Greece possessed only 61 motor-ships of over 100 tons gross, totalling 19,352 tons gross. This is because a large number of Greek vessels are over twenty years old, for Greece recruits her merchant ships largely from the second-hand market, in which the motor vessel does not figure prominently. The first motor-ship built specially for Greece was completed in 1939 for Síros owners. The Greek fleet probably contains as heterogeneous a collection of vessels as may be found under any flag, since the majority of the vessels were not built for their present owners The largest ship in the Greek fleet, which even includes old British naval auxiliaries, is the ex-British liner *Tuscania* (16,991 tons gross), now known as the *Nea Hellas*. About 91 % of the vessels by gross tonnage are under 6,000 tons gross, and some 58% of the fleet fall in the 4,000–6,000 tons gross category.

In 1939, there were nine vessels in the Greek fleet carrying petroleum in bulk. They varied between twelve and fifty-two years of age and totalled 27,906 tons gross, while the largest was 7,000 tons gross. A further four vessels of 22,547 gross tons were fitted to carry cargoes of vegetable oil or fuel oil in deep tanks or double-bottom compartments.

Age of the Merchant Fleet and Country of Building

The age-composition of the Greek fleet is one of its outstanding features. Over three-quarters of the vessels in the merchant fleet in 1939 were more than 20 years old, chiefly because they have been purchased as second-hand tonnage, and vessels over 20 years old and even considerably over 30 years old were quite commonly purchased. Only a very small percentage of Greek vessels have been

Age of Merchant Fleets in 1939

Country	Total gross tonnage (thousands)	Age in years as % of total tonnage					
		Under 5	5–10	10–15	15–20	20–25	Over 25
Greece	1,781	5 8	0 5	2 8	13 3	33 4	44 2
United Kingd'm	17,891	21 1	10 5	24·1	21 0	12 6	10·7
Denmark	1,175	16 7	16 8	17 2	24 2	20 8	14 3
Norway	4,834	24 6	20 7	18 4	15 7	9 8	10 8
Sweden	1,577	15 0	9 9	15 5	18 5	9 3	31 8
Netherlands	2,970	22 5	14 9	18 9	25 5	9 4	8 8
Germany	4,483	19 9	5 3	22 9	32 5	5 2	14 2
World	68,509	15 4	9 9	15 7	22 0	16 4	20 6

Source: *Lloyd's Register of Shipping*, 1939–40, vol III, Statistical Tables (London, 1939).

built to the order of their present owners, mostly because of lack of capital. Considerable numbers of British ships are sold at little more than breaking-up prices to Greek buyers, who can run them profitably on a family basis where British owners would suffer losses. Indeed, when bought many of the vessels have little competitive value as cargo liners or even as tramps. Hence the Greek cargo ship has the characteristics of British ships of some twenty years ago —a straight stem, straight masts, often with topmasts, and a tall thin funnel. About 76% of the Greek fleet has been built in Great Britain, the yards of which have also supplied exclusively the small percentage (about 6%) of Greek ships which have been specially built for Greece, mostly since 1938 (Fig. 32). Some of these new vessels are oil-burning steamers.

On account of the age of the fleet, the reputation of Greek ships suffers and the insurance rates covering them are, in consequence, high. Insurance rates are also always higher for ships over 25 years old. Although the value of a ship depends not so much on its age as on its condition, Greek vessels are, in most cases, run with a minimum of necessary repairs and maintenance, and their external appearance is frequently neglected. In consequence of the small margin of safety, as well as a result of their pioneering work on constantly changing routes, casualty rates at sea among Greek vessels are high, and in the period 1920–38 (inclusive) Greece lost on an average 2·69% of the tonnage owned in the country per year (ships over 100 tons gross), a figure which easily exceeds that for any of the other principal maritime countries (compare United Kingdom

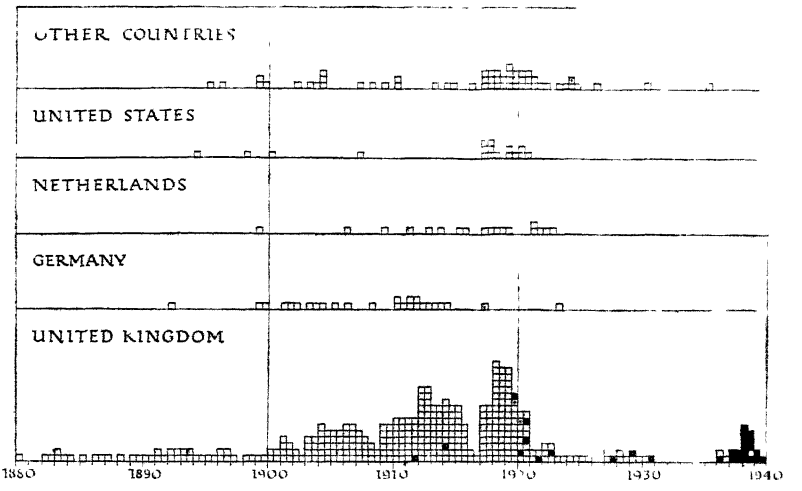


Fig. 32. Age and country of building of Greek merchant ships (over 1,000 tons gross) in 1939

Compiled from official sources.
Each square represents one ship, and two columns are given to each year Every ship (over 1,000 tons gross) in the Greek merchant fleet in 1939 has been plotted according to the year and country of building The black squares indicate vessels built specially to Greek order and except for one motor vessel they are all steamers The open squares represent steamers purchased second-hand; those with a dot are motor vessels.

0·46 %, Denmark 0·51 % and the Netherlands 0·3 %). The annual losses varied between 0·81 % in 1935 and 8·92 % in 1921, and were consistently higher than the world average.

Shipping Companies and Services in 1939

Greek seafarers and merchants may be found in many of the ports and great cities of the world. Many of them have acquired considerable wealth and have purchased ships which they operate with Greek crews under the Greek flag; as a result the activities of these Greeks abroad are an important source of foreign exchange for Greece. The ownership of Greek vessels is often difficult to ascertain with any accuracy. In addition to vessels owned by Greeks in London, which is perhaps the most important Greek shipping centre, a number of vessels are owned in France, Roumania and Egypt, while nineteen cargo and river vessels of 42,040 tons gross are owned by Greeks in Shanghai and sail almost exclusively in Chinese waters

under the Greek flag. On the other hand, vessels owned in Greece occasionally fly foreign flags, and particularly that of Panama; 27 ships of 110,956 tons gross owned in Greece in 1939, some even trading exclusively in the Mediterranean, had a Panamanian registration, which is usually understood to be a matter of convenience, mainly because it is cheaper and because conditions and regulations are less strict than in the true maritime countries. A number of the vessels, however, were registered temporarily as a protest against what was considered undue interference by the Greek government in the few years prior to 1939 (see p. 206). It was proposed in 1940 that legislation be introduced to secure the return to the Greek flag of Greek merchant ships flying foreign flags.

The majority of Greek vessels are owned by private firms, either by an individual, by a family or by a group of individuals. The master of a ship may often be its owner or part-owner. There is usually one main owner of a ship and other individuals are shareholders. The ship is divided into 100 shares and each holder has one or more shares. There are a large number of single-ship owners and only a very limited number of companies; indeed, the latter frequently operate vessels for groups of single-ship owners.

Some idea of the distribution of owners, particularly within Greece, may be obtained from the table on page 203 of ports of registry in 1938, and although registry at a port is not necessarily indicative of ownership at that port, it is frequently the case in Greece.

The predominance of Piraiévs with some 41 % is marked, while the Aegean islands of Ándros, Khíos and Síros own 20 %, 12 % and 10% respectively of all vessels, and are much more important than the other mainland ports. Most of the ships registered at these islands are cargo vessels, engaged mainly in foreign trade, and they rarely visit their home ports They are registered there, however, for reasons of local patriotism. The sailors of Ándros are well known and are found wherever Greeks sail the seas. Síros is an important coaling station on the route from southern Greece to the Black Sea, in addition to being the centre of coastal traffic and the transhipment point for the Aegean islands; for fifty years after the War of Independence it was the shipping metropolis of Greece, but its significance as a shipping centre has since declined. During the war of 1914–18 several Greek shipping companies transferred their headquarters from Piraiévs to Síros. Khíos, which from the earliest times has had a relatively large shipping trade, had a considerable share of the

Ports of Registry, 1938

Port	Cargo vessels		Passenger vesssels		Various		Total	
	No	Gross tonnage	No	Gross tonnage	No.	Gross tonnage	No.	Gross tonnage
Piraiévs	241	717,358	61	48,528	20	3,444	322	769,330
Ándros	89	370,569	—	—	—	—	89	370,569
Khíos	55	230,268	—	—	—	—	55	230,268
Síros	45	185,897	2	1,282	—	—	47	187,179
Itháki	26	109,690	—	—	—	—	26	109,690
Argostólion	23	98,059	—	—	—	—	23	98,059
London	13	58,839	—	—	—	—	13	58,839
Ídhra	5	20,610	—	—	—	—	5	20,610
Vathí, Sámos	2	5,982	3	3,762	—	—	5	9,744
Thessaloníki	3	3,476	—	—	1	50	4	3,526
Mitilíni	2	1,454	—	—	—	—	2	1,454
Pátrai	1	99	2	482	—	—	3	581
Vólos	—	—	4	943	—	—	4	943
Kalámai	1	98	1	78	—	—	2	176
Khalkís	1	5,253	—	—	—	—	1	5,253
Spétsai	1	2,171	1	176	—	—	2	2,347
Khaniá	1	724	—	—	—	—	1	724
Zákinthos	1	223	—	—	—	—	1	223
Lávrion	1	1,476	—	—	—	—	1	1,476
Kérkira	1	2,709	—	—	—	—	1	2,709
Total	512	1,814,955	74	55,251	21	3,494	607	1,873,700

Source: *Annuaire statistique de la Grèce*, 1939, p 241 (Athènes, 1940).

coastal traffic of Turkey until this traffic was closed in 1926 to all but Turkish ships.

Ocean-going Shipping

About 90 % of the Greek merchant fleet consists of ocean-going tramps engaged in international trade, a higher percentage than that of any other country. The tramp fleet ranked second in the world by tonnage after that of Great Britain. The table on page 204 shows the fleets of the chief companies and owners, and details of the types of voyage of their vessels. Voyages are made to all parts of the world according to the demands of the charter market.

Short-sea and Coastwise Shipping (Fig. 33)

The short-sea and coastwise shipping companies are of minor importance when compared with the enterprises owning ocean-going

Fleets of the Principal Shipping Companies and Owners in Greece, 1939

Owner	No of vessels	Gross tonnage	Class of voyage in 1938	Notes
J. D. Chandris, Piraiévs	11	55,467	U.K., Cont., Baltic, White Sea, Med., W.C. Africa, Cape, W.I., Plate, Pacific, Far East, U.S., Australia	World-wide tramping. Ships all over 15 years old
M. A. Embiricos (*Embiricos Line*), Paris & Athens	9	39,951	U.K., Cont., Baltic, Med., W.C. Africa, Plate, Far East	General tramping
S. G. Embiricos, Athens	7	32,568	U.K., Cont., Med., W.C. Africa, W.I., Plate, Pacific, East	General tramping. Owns one tug
Goulandris Bros., Piraiévs*	11	49,232	U.K., Cont., Med., Baltic, W.C. Africa, W.I., Plate, Pacific	Tramping
N. G. Livanos, Piraiévs	18	91,922	U.K., Cont., Baltic, Med., U.S., W.I., E.C. Africa, W.C. Africa, Cape, Plate, Pacific, Far East	Includes vessels of four subsidiary owners. Nine vessels built since 1936 for the firm
G. Nicolau Ltd., London and Athens	6	34,796	U.K., Cont., Baltic, Med., U.S., W.I., Pacific, East	Tramping. 2 vessels under 10 years old
P. M. Nomikos Ltd (*Thiraiki Line*), Piraiévs. Managers for four other owners	12	36,000	U.K., Cont., Baltic, Med., British North America, U.S., W.I., W.C. Africa, Plate, Far East	Tramping. One tanker of 7,020 tons gross. One vessel under Panamanian flag
Rethymnis & Kulukundis Ltd., London and Athens. Agents for a group of Athens, Piraiévs, Síros, and Khíos owners	17	83,602	U.K., Cont., Baltic, Med., U.S., W.I., W.C. Africa, Red Sea, Cape, Plate, Pacific, Far East, Australia	General tramping. One vessel each under Egyptian and Panamanian flags
Chief companies				
Kulukundis Shipping Co. S.A. (inc. *Atlanticos S.S. Co. Ltd.*), Piraiévs	23	117,063	U.K., Cont., White Sea, Med., U.S., W.I., W.C. Africa, Cape, Plate, Pacific, Far East	Four vessels built in 1938
Kassos S.N. Co. Ltd., Síros	7	32,545	U.K., Cont., Med., U.S., W.C. Africa, Cape, Plate, Pacific, Far East	Two vessels built since 1938, including first motor vessel specially built for Greece
G. M. Stamatelatos, Shanghai	11	17,954	Trading exclusively in the Far East	Eight vessels built in China

* This firm also operates 21 vessels of 95,395 tons gross for Ándros, Athens, Piraiévs, Síros and Paris owners. The fleet includes the *Nea Hellas* (*General S.N. Co. Ltd., of Greece*), which ran to the United States. A subsidiary company is under the Panamanian flag.

tramps. The *Hellenic Lines Ltd.* (8 vessels totalling 18,462 tons gross) was engaged in services to north-west European ports—Antwerp, Rotterdam, Hamburg, Hull and London. The only other important company with short-sea services, the *Hellenic Mediterranean Lines Ltd.*, operated to Albania and Italy and to Cyprus, Syria, Palestine and Egypt. It owned 4 vessels totalling 8,097 tons gross and ran passenger services twice weekly on the Piraiévs-Pátrai-Kérkira-Santi Quaranta-Brindisi route, weekly from Piraiévs to Alexandria-Port Said-Alexandria-Piraiévs and fortnightly on the route Thessaloníki - Vólos - Khalkís - Piraiévs - Limassol - Larnaca - Famagusta-Tripoli (Syria)-Beirut-Haifa-Jaffa-Port Said. Although Greeks preferred to use their own ships on these routes, the Greek vessels met with considerable competition from Italian lines on the runs to Italy and to Egypt, and from fast, modern Roumanian and U.S S.R. ships to Palestine and Egypt.

The passenger vessels which carry a good deal of the coastal and island traffic (passengers, mails and cargo) of Greece are largely owned by shipping companies with headquarters at Piraiévs. The standard of Greek coasting passenger steamers is uneven owing partly to their divergent sizes, the vessels are fairly large and comfortable on the more important routes, but on less important routes the steamers are often extremely small and passenger space is frequently sacrificed to the requirements of the cargo, which may be a flock of sheep, goats or other livestock. In 1938 there were daily services from Piraiévs to Pátrai via the Kórinthos Canal and to Kaválla and Kalámai; sailings to Thessaloníki, via Vólos, and to Kríti, were made three or four times weekly. The principal coastwise shipping company is the *Hellenic Coast Lines Ltd.* (17 vessels totalling 19,508 tons gross), which operated passenger and cargo services to most Greek coastal ports and outlying islands; it was formed in 1927 by the amalgamation of a number of small firms. The vessels in the fleet vary from 316 to 3,701 tons gross, three having a loaded speed of 15 knots (Plate 43). The company also managed the *Hellenic Mediterranean Lines Ltd.*

State Aid to Shipping

Government assistance to shipping had not reached the proportions it had in other countries and a great deal was left to private enterprise. Ships are not normally subsidized and most of the measures taken, such as the granting of mail subsidies, are confined to ships

in coastwise services. The government has, however, shown active interest in the mercantile marine since the war of 1914–18, partly because of its place in the national economy and partly because of the exclusion of Greek shipping from the coastwise trades of Turkey and those countries bordering the Black Sea, trades which were formerly of considerable importance. But although state interest has resulted in the promulgation of various decrees and legislative measures, there has been no large-scale and drastic reorganization of the merchant fleet. A policy of renewing old tonnage has been encouraged in order to maintain the fleet in a reasonable state of efficiency and safety and so raise its competitive value. In 1925 a decree was issued, the object of which was to discourage the use of old ships—rendered even more obsolescent by the introduction of Diesel-engined vessels and oil-fired steamships—by taxing vessels older than ten years according to their age and tonnage; the proceeds of this tax were used for subsidizing the newer vessels Other measures included the encouragement and protection of Greek passenger services, the restriction of coastwise shipping to the Greek flag and the establishment of a training school for officers at Piraiévs. An act was passed in 1926 which aimed at the organization of the coasting services on a more efficient basis Formerly ships of rival companies frequently started at the same time from Piraiévs with the same itinerary for the express purpose of competition, and charges for passengers and freight were the subject of considerable bargaining. After the act, it became illegal to charge rates lower than the fixed tariff, to give rebates (by which the shipping company returned a percentage of the freight charge to the trader if that person constantly shipped by that company), or to sail simultaneously with another ship for competitive purposes. A further decree promulgated in 1932 stipulated that coasting vessels of over 50 years of age were to be withdrawn from regular service, and it is significant that the tonnage of vessels broken up in each of the years 1932–34 was higher than for any other year since 1924. The purchase of foreign ships of over 20 years of age for the Greek flag was also forbidden.

Early in 1936, however, much more vigorous steps were taken. An Under-Secretary for Mercantile Marine was appointed, and he was practically independent of the Minister of Marine. The department under his direction introduced legislation on a number of matters affecting the welfare of personnel; it was also concerned with the reorganization of both coastwise and foreign passenger

services. In the case of the coastwise services, some action had been made necessary by the failure of the existing companies to provide a suitable scheme for the renovation of their tonnage. Services with Cyprus were restored in 1936 with the aid of an annual subsidy of 5,850,000 drachmae. The contract provided for weekly sailings on the route Thessaloníki-Vólos-Piraiévs-Cyprus-Tripoli (Syria)-Beirut-Jaffa-Haifa-Port Said-Alexandria. Tenders were also invited for a concession to operate a Piraiévs-New York service, but the only proposal which was regarded favourably came from a British company. The route to New York was formerly operated by several lines which catered for the important emigrant traffic in steerage accommodation, but after the introduction of the rigid immigration laws of America in 1921 and 1924, the traffic never again reached the levels attained just before the war of 1914–18.

After the outbreak of war in 1939, Greek vessels were chartered freely by Great Britain, and they made considerable profits. As a result the government decided that freight vessels of over 500 tons were to be taxed on tonnage in order to counterbalance the losses caused to Greek economy by the war. At the end of the year a law was passed which established a marine insurance organization to cover Greek vessels and crews against war risks when navigating in foreign waters, and it provided for considerable compensation in the case of death or partial disablement. The premium was to be paid by shipowners in foreign exchange. During the early part of 1940, Greek shipowners made large-scale purchases of tonnage abroad and almost made up for the loss of tonnage due to the war, which up to 23 March 1940 amounted to 64,839 tons gross. These purchases involved no loss of foreign exchange by Greece, since the price was covered by the insurance values of the ships lost.

Personnel

According to the census of 1928, a total of 34,029 persons were employed in the mercantile marine. During 1931, it was estimated that 16,000 seamen were employed in the Greek merchant fleet, of whom 11,000 were employed in steamers and 5,000 in sailing vessels. In 1935, of a total of about 19,000 men, 16,000 sailed in steamers and the remainder in sailing vessels.

The latest available figures for the numbers of all classes of seafaring men, which are given in the table on p. 208, relate to 1934.

Categories of Ships' Personnel

Category	Enlisted within Greece			Enlisted abroad			Total
	Census return	Others		Census return	Others		
		Greeks	Foreigners		Greeks	Foreigners	
Captain	2,172	1	1	221	—	—	2,395
Chief officer	1,325	2	1	8	—	—	1,336
Engineer	2,860	1	—	230	—	1	3,092
Wireless Telegraphist	615	—	—	55	—	3	673
Boatswain	852	—	—	69	—	—	921
Seaman	10,390	23	—	401	9	4	10,827
Fireman	4,589	—	—	490	50	20	5,149
Trimmer	2,084	2	—	94	25	33	2,238
Greaser	458	1	—	10	—	—	469
Cook	1,047	—	—	60	9	3	1,119
Steward	2,010	—	1	103	22	9	2,145
Carpenter	149	—	—	21	2	1	173
Other Categories including Divers	2,250	42	8	89	20	4	2,413
	30,801	72	11	1,851	137	78	32,950

Source *Annuaire statistique de la Grèce*, 1936, p. 262 (Athènes, 1937)

There are thus approximately 7,500 officers. In 1936, there were four schools of merchant navy instruction in Greece.

Since 1909, when there was a widespread strike among the crews of Greek steamers at Piraiévs for better living conditions on board ship, there have been numerous legislative decrees for the benefit of seamen, especially an act for arbitration in employment disputes. Strikes have largely been averted owing to the willingness of the government, the shipowners and the seamen's unions to co-operate. The more serious strikes threatened after 1925 over the question of wages, which decreased with the fall in the purchasing power of the drachma.

The rate of wages paid is very low, and this has been mainly responsible for the large share of Greece in the world's carrying trade; in addition to the low level of running costs, many vessels have been acquired cheaply. The master frequently selects his crew mainly from his own relations, who can afford to take low wages because they receive usually a small share of the profits. These low costs enabled the Greek fleet to resist the effects of the world economic depression, with its decrease in foreign trade, probably longer than

any other shipping nation. In order to alleviate unemployment during the depression, however, a new regulation was introduced by which Greek ships had to carry a larger crew than was formerly the case; this had the effect of further reducing the earning capacity of Greek ships, for with the small margin of profit then obtaining, the increase in wages meant in many cases a loss The masters of ships were also not allowed to choose their own men, but had to take them on strictly in rotation from the unemployment list. This restriction of freedom of choice was seriously resented, because owners could not then employ their relations.

Shipping Traffic

The table on p. 210 summarizes the total amount of shipping traffic at Greek ports during 1938, and includes all steamers and sailing vessels, whether engaged in foreign trade, the calling-foreign trade, or the coastwise trade, the three categories recognized in official Greek shipping statistics. Tables showing the share of each trade in these shipping movements are also given.

Coastwise Traffic

Coastwise ships are those employed exclusively in trading from one Greek port to another, but the cargo carried by these vessels may be, in part, foreign transhipment cargo. A small percentage of the passengers carried are similarly proceeding to or from foreign voyages. In Greece the coastal trade is restricted to Greek vessels, and in 1938, vessels engaged in coastwise trading formed the majority of entrances and clearances of Greek vessels, both steam- and sail-driven. The tonnage of cargo carried exceeded that carried by Greek vessels in the foreign trade by 1,078,418 tons. In addition, 98 % of all passengers sailing in Greek ships were conveyed in coastwise ships.

The table (see p. 211) shows that sailing vessels are relatively more important than steamships in the carriage of coastwise cargo, the amounts of cargo being approximately equal, although the net tonnage of the steamers is over ten times greater than that of the sailing vessels. Except for a small percentage of the passengers and goods which was in transit on foreign journeys (all the transhipment goods and passengers were carried by steam vessels), the traffic related to the country's internal trade. The coastwise vessel is the principal means of communication in Greece and the country has always been

Total Shipping Movements at Greek Ports in 1938

	Entrances				Clearances			
	No.	Net tons	Cargo-tons	Passengers	No.	Net tons	Cargo-tons	Passengers
Greek	37,072	11,200,989	2,968,199	932,929	36,872	11,110,169	1,517,318	987,818
Total all countries	41,931	19,810,603	4,135,106	1,012,263	41,731	19,708,861	2,308,046	1,060,175
Greek percentage	88 4	56 5	71 7	92 1	88 3	56 3	65 7	93 1
,, ,, 1937	88 9	56 8	71 7	92 0	88 9	56 8	60 5	92·4
,, ,, 1936	88 9	56·8	74 2	92 4	88 8	57 0	68 4	93·2

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp 5 and 9 (Athènes, 1939)

Shipping Movements by Trade in 1938

	Entrances				Clearances			
	No.	Net tons	Cargo-tons	Passengers	No	Net tons	Cargo-tons	Passengers
FOREIGN TRAFFIC								
Greek	1,109	1,057,455	1,166,890	14,957	844	895,953	273,349	13,283
Total all countries	3,585	6,283,972	1,984,638	81,683	3,276	6,019,478	774,134	69,683
Greek percentage	30 9	16 8	58 7	17 5	25 7	14 8	35 3	19 0
CALLING—FOREIGN TRAFFIC								
Greek	690	750,035	425,410	1,305	860	924,206	101,211	1,179
Total all countries	3,073	4,133,132	774,569	13,913	3,287	4,399,373	391,154	17,136
Greek percentage	22 4	18 1	54 9	9 3	26 1	21 0	25 8	6 8
COASTWISE TRAFFIC								
Greek total	35,273	9,393,499	1,375,899	916,667	35,168	9,290,010	1,142,758	973,356
Greek percentage	100	100	100	100	100	100	100	100

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 13, 17, 21, 25–7 (Athènes, 1939).

Coastal Shipping Traffic, 1938

	Entrances				Clearances			
	No	Net tonnage	Cargo-tons	Pas-sengers	No	Net tonnage	Cargo-tons	Pas-sengers
Steam	20,215	8,622,433	699,771	915,914	20,148	8,523,375	562,113	972,597
Sail	15,058	771,066	676,128	753	15,020	766,635	580,645	759
Total	35,273	9,393,499	1,375,899	916,667	35,168	9,290,010	1,142,758	973,356

Source *Statistique du mouvement de la navigation pendant l'année* 1938, pp 26–7 (Athènes, 1939)

dependent upon imports for a large amount of its food, and for most of its manufactured goods. At the big importing centres of Piraiévs and Thessaloníki, transhipment is made, from Greek as well as foreign vessels, to the small craft that ply along the coast and among the islands, distributing or collecting cargoes. Owing to the limitations of land transport, goods must be unloaded as near to the point of consumption as possible. Consequently a large number of ports are used, and the sailing vessel or caique, which is frequently fitted with an auxiliary petrol motor, is naturally important in the trade of the smaller ports and islands. The poor harbour facilities of many of the Greek ports limit the size of the vessel that can be used.

The complex network of regular coastal shipping routes, which reveals a dense concentration upon Piraiévs, is shown in Fig. 33. Coasting vessels assume an important part in the traffic passing through the Corinth canal, owing to its limitations upon the size of vessel using it, and to its value as a short cut between the eastern and western coasts of Greece.

The sailing vessels are of two main kinds. The typical caique has a raked stem and a transom stern, a considerable sheer fore and aft, and one mast with a lateen sail, which is similar to that of a felucca and a common feature of Mediterranean craft (Plate 42). In addition, there is a larger type of sailing vessel with a counter stern and a bowsprit, two masts and a schooner-type or lugger rig.

Calling-Foreign Traffic

Ships which engage in the calling-foreign trade are those whose port of origin or destination is foreign, but which call at Greek ports

during the voyage, without, however, engaging in coastal traffic. Italian tonnage is most important in this traffic, which in general shows the same features as those obtaining in the direct foreign

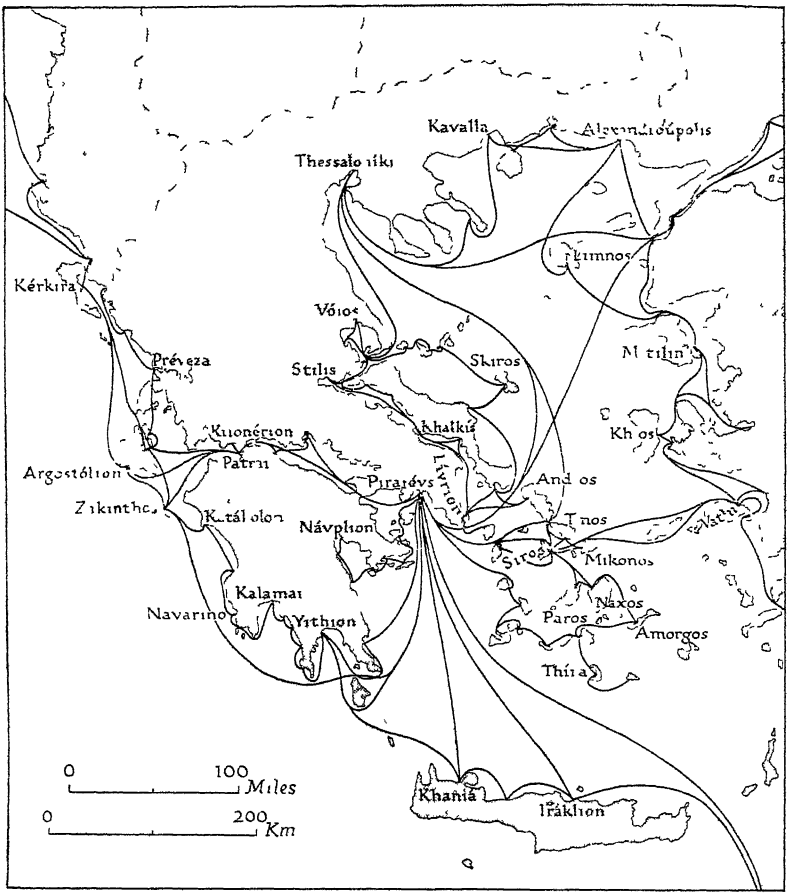


Fig 33 Coastal shipping routes
Based on a map at the end of *Les Guides Bleus—Grèce* (Paris, 1935).

trade; Greek vessels carry bulk cargo and consequently are fully laden, whilst Italian liners pick up such parcels as are available.

Foreign Traffic

Although the Greek flag easily occupies first place in the total shipping movements at Greek ports, with the Italian, British and

German flags next in order of importance, only a small amount of this Greek shipping is engaged in foreign trade. Among ships entering or clearing direct on foreign voyages, the Italian flag is more important than that of Greece. The following more detailed table of steamship movements to and from foreign ports includes motor-vessels:

Shipping Movements in the Foreign Trade by Flag, 1938

Flag	Laden					In ballast	
	No.	Net tons (1,000)	Percentage of total tonnage	Cargo (1,000 tons)	Percentage of cargo	No	Net tons
ENTRANCES							
Italian	774	1,867	34 3	102	5 2	72	113
Greek	711	906	16 6	1,139	58 4	120	134
British	240	545	10 0	194	9 9	53	75
German	138	367	6 7	87	4 4	103	154
American	81	313	5 8	25	1 3	25	82
Roumanian	160	300	5 5	50	2 6	3	11
Jugoslav	109	241	4 4	10	0 5	26	63
French	71	265	4 9	21	1 1	—	—
Dutch	92	129	2 4	124	6 4	61	71
U S S R	70	144	2 6	80	4 1	2	5
Norwegian	55	94	1·7	45	2 3	13	20
Total all countries	2,695	5,455	100	1,952	100	562	840
CLEARANCES							
Italian	765	1,864	39 8	119	15 6	79	140
Greek	326	367	7 9	270	35 2	376	518
British	182	458	9 8	43	5 6	106	158
German	144	331	7 1	31	4 0	91	126
American	75	297	6 3	22	2 9	34	110
Roumanian	141	280	6 0	18	2 4	15	26
Jugoslav	125	273	5 8	138	18 0	4	8
French	52	247	5 3	5	0 7	18	13
Dutch	88	98	2 1	35	4 6	62	94
U S S.R.	46	98	2 1	2	0 3	23	45
Norwegian	51	76	1 6	27	3 5	12	30
Total all countries	2,217	4,677	100	766	100	871	1,325

Source. *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 10–11, 14–15 (Athènes, 1939)

But, although the Italian flag is most important by net tonnage, the Italian vessels do not carry a correspondingly high proportion of the

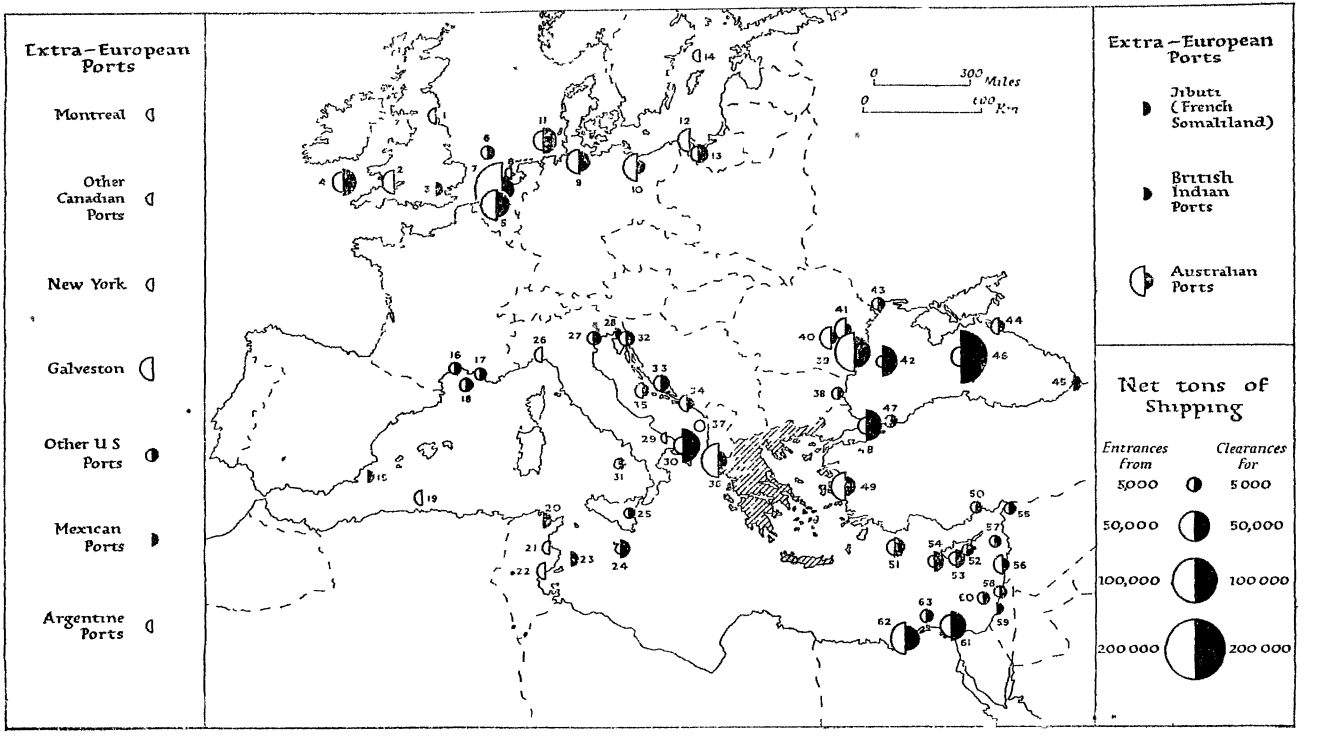


Fig. 34 Movements of Greek vessels (laden and in ballast) to and from foreign ports in 1938

Based on figures in *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 38–58 (Athènes, 1939). The symbols for each foreign port represent the total traffic going to and coming from all Greek ports together. The figure shows the irregularly nature of the voyages made by ships engaged mainly in the tramp trade Entrances and clearances of less than 500 tons net have been omitted. For key to ports see p. 215.

cargoes. Greek vessels have a much higher load index (tonnage of goods per net ton of shipping space), carrying 58% of the weight of incoming cargo and 35% of all outgoing cargo. The Italian ships were mainly operating as liners, which must sail from a number of ports as advertised, whether cargoes are available or not. Greek vessels, on the other hand, carried bulk cargoes, as they are for the most part tramp vessels; these always operate most profitably if they are as fully laden as possible, at the same time making the minimum number of intermediate calls. The Greek, Jugoslav and Italian flags, in that order, carry the highest percentages of the outward cargoes. Unlike the ships of any other flag, a much higher net tonnage of Greek shipping engaged in foreign trade leaves in ballast than with cargo. Italian vessels carried about 27% of the passengers travelling to and from Greece, while British vessels carried about 20% and Greek vessels only 18%.

Greek ships carried 28,170 out of 32,726 tons of cargo entering in 1938 in sailing vessels from foreign ports, but only 3,722 tons out of 7,955 tons of cargo clearing. No passengers were carried on foreign voyages. The remaining cargoes were mainly carried in Italian, Jugoslav and British sailing vessels.

The largest tonnage of entries of Greek ships into Greek ports in 1938 came from Dutch, Roumanian and Egyptian ports, while the greatest tonnage of cargo entered from Dutch, German and British ports (Figs 36 and 37).

The biggest clearances were made to the U.S.S R. and Roumanian ports, especially to Constanza and Danube ports; these were, with few exceptions, in ballast, for the purpose of loading grain and other cargoes. Large clearances in ballast by the smaller type of tramps were also made to Italian and Turkish ports, while most cargo cleared to Germany, Danzig, the Netherlands and Belgium. Some 70% of the foreign passengers travelled to and from Egypt, while about

The ports are numbered as follows 1 Newcastle, 2 Cardiff, 3. London, 4 Other British ports; 5 Antwerp, 6 Other Belgian ports; 7 Rotterdam; 8 Amsterdam; 9 Hamburg; 10. Stettin, 11 Other German ports, 12 Gdynia, 13. Danzig; 14. Swedish ports, 15 Spanish ports; 16. Sète; 17 Marseilles; 18. Other French ports, 19 Algerian ports, 20. Tunis, 21 Sousse, 22 Sfax, 23. Other Tunisian ports, 24 Malta; 25 Catania, 26 Genoa, 27 Venice; 28. Trieste; 29 Bari, 30. Brindisi, 31. Other Italian ports; 32 Susak, 33 Split; 34. Dubrovnik, 35 Other Jugoslav ports, 36 Santi Quaranta; 37 Other Albanian ports; 38. Burgas, 39. Constanza, 40 Braila; 41. Galatz; 42 Other Roumanian ports; 43 Odessa; 44. Novorossisk, 45 Batum, 46 Other U S S.R ports, 47. Zonguldak, 48. İstanbul; 49. Smyrna; 50. Mersin, 51. Other Turkish ports; 52. Larnaca; 53. Limassol, 54. Other Cyprian ports; 55. Alexandretta; 56 Beirut; 57. Other Syrian ports; 58. Haifa, 59 Jaffa; 60 Other Palestinian ports; 61. Port Said; 62. Alexandria, 63. Other Egyptian ports

Movements of Greek Steamers to and from Greek Ports, in Foreign Trade, in 1938

Country	Entrances				Clearances			
	No	Net tons	Cargo—tons	Passengers	No	Net tons	Cargo—tons	Passengers
Egypt	107	115,524	88,304	10,701	98	94,378	18,530	9,736
Albania	60	54,048	7	18	13	9,576	2	275
Australia	13	41,810	59,908	10	4	15,104	—	—
Belgium	18	41,376	10,359	21	18	30,777	43,045	—
Germany	45	86,240	142,461	5	34	56,998	61,748	—
U.S.S R	29	32,370	43,923	—	90	179,690	—	—
Italy	43	49,244	4,451	217	86	81,106	912	655
Great Britain	39	54,637	109,852	25	22	38,920	14,188	1
Netherlands	85	181,055	349,542	62	13	26,052	45,162	—
Roumania	198	163,318	139,597	281	137	123,055	6,682	6
Turkey	76	54,918	17,007	166	76	91,754	4,511	201
All countries (inc. sailing vessels)	1,109	1,057,455	1,166,890	14,957	844	895,953	273,349	13,283

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, p 70 (Athènes, 1939).

15 % were carried between Greece and Cyprus. The largest numbers of entrances and clearances of sailing vessels were between Greek and Jugoslav and Greek and Turkish ports, most of the cargo also being carried on these routes. The detailed movements of Greek vessels to and from Greek ports in 1938 are shown in Figs. 34 and 35. The proportion of Greek tonnage trading with each country and the proportion of cargo carried to and from each country in Greek ships are shown in Figs. 36 and 37.

International Tramp Traffic

Statistics relating to the movements of Greek vessels to and from foreign ports are misleading, because the majority of Greek ships are

The ports are numbered as follows: 1. London, 2 Other British ports, 3. Antwerp; 4. Rotterdam, 5. German ports; 6. Spanish ports; 7 Marseilles, 8 Other French ports; 9 Malta; 10 Catania; 11 Genoa; 12. Venice, 13 Trieste, 14 Brindisi; 15. Other Italian ports, 16 Susak; 17. Split; 18. Other Jugoslav ports, 19 Santi Quaranta, 20. Other Albanian ports, 21. Burgas, 22. Constanza; 23 Braila, 24. Galatz, 25 Other Roumanian ports; 26 Odessa, 27. Novorossisk, 28 Batum, 29. Other U.S.S R. ports, 30. Zonguldak; 31 Istanbul; 32 Smyrna; 33. Mersin; 34. Other Turkish ports, 35. Cyprian ports, 36. Alexandretta, 37. Beirut, 38. Other Syrian ports; 39. Haifa, 40. Port Said, 41. Alexandria, 42. Other Egyptian ports

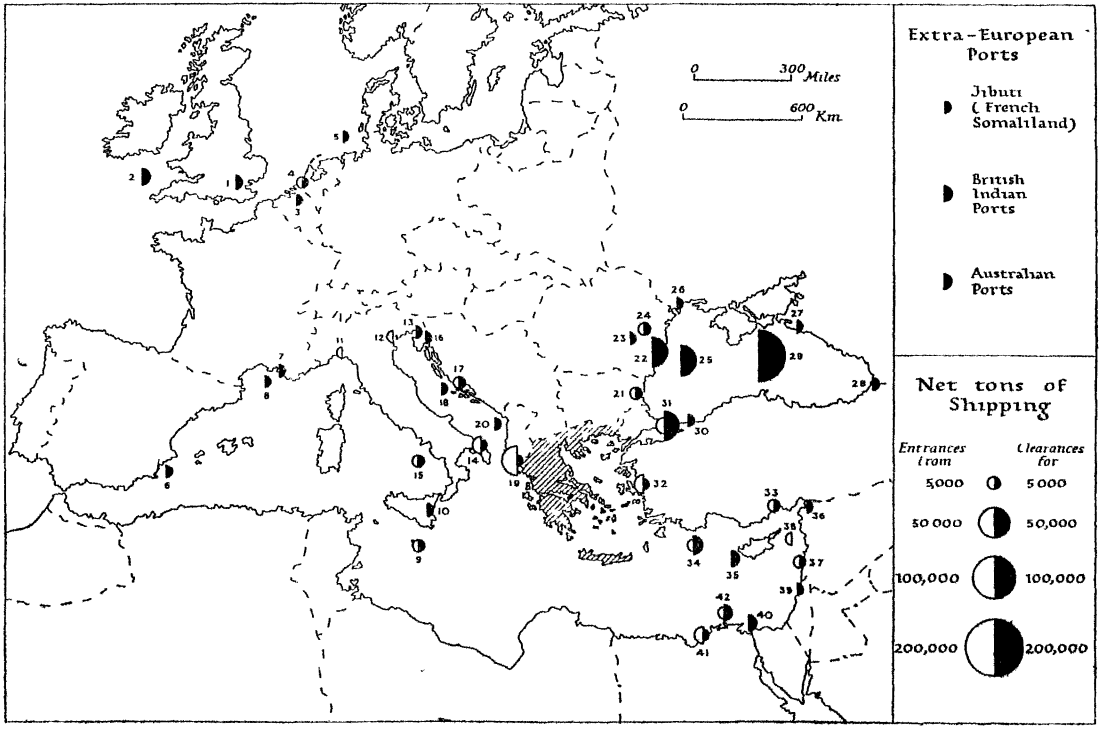


Fig. 35. Movements of Greek vessels (in ballast) to and from foreign ports in 1938

Based on figures in *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 59–69 (Athènes, 1939)

This figure may be compared with Fig. 34. The amount of ballast tonnage moving to Black Sea ports from Greek ports is striking. Movements in ballast are a characteristic feature of vessels engaged in the tramp trade. For key to ports see p 216.

engaged in the tramp trade; entrances and clearances at Greek ports give an inadequate idea of the scope of their operations. They earn freights between many parts of the world and their voyages frequently begin and terminate at foreign ports, hence they do not appear in Greek port statistics. These voyages vary in scope according to world market conditions, and may not be similar in any two years. It has been estimated that not more than 40 % of the cargo carried by the Greek mercantile marine consists of the foreign trade of Greece itself (see p 196). Standard cargoes are coal outwards from Europe and grain homewards. Thus, Greek vessels in some cases may not touch at a Greek port for a period of months or over a year. Some typical voyages of Greek tramps are those in which the ships carry coal from Poland, the Netherlands or South Wales outwards to River Plate or Mediterranean ports, returning from the River Plate with cargoes of grain to north-west European ports, or with phosphate from French North Africa or with grain and timber cargoes from Black Sea ports A cargo such as manganese ore may be brought back from Natal or the Gold Coast to north-west Europe, and Greek vessels also engage in the Far East soya bean trade and in the Baltic and White Sea timber trades in summer. During the first ten months of 1935 the total of Greek shipping entering the River Plate was higher than that of any other nation except Britain. Some operations entail round-the-world voyages. For example, the s.s. *Dimitrios Chandris*, of 4,643 tons gross, sailed from Rio Grande (Mexico) in August 1938 and proceeded in turn to Rio de Janeiro, Rotterdam, Stettin, Spezia, Piraiévs, Amorgós, Sabang (Sumatra), Hong-Kong, Hagashiwase and Karatsu (Japan), Vancouver, Victoria, Balboa, Kingston (Jamaica), arriving at London in September 1939. The nature of tramp steamer operation involves a relatively large number of voyages in ballast, often over considerable distances, either between Mediterranean and Black Sea ports, or even across the Atlantic and Pacific Oceans.

Freight Earnings

The amount of revenue earned by Greek vessels is difficult to determine because of the many voyages between foreign ports, while most of the ships are owned by individuals and not corporations, and only the latter are compelled to publish yearly balance sheets. The yearly returns vary considerably since so many cargoes carried by Greek ships are dependent upon the success of crops in any particular year.

Greek cargo shipping has been in recent years a keen competitor in all the principal world charter markets for bulk cargoes, and it has been particularly prominent in the River Plate trade and in coal shipments from European ports. Greece is also favourably placed for taking part in the Black Sea trade, and until recent years many of her vessels were on charter for the export trade of the U.S.S.R. It is estimated that of the total freight earnings of the Greek fleet in 1936 about 30 % was earned by vessels operating from the River Plate, 10 % by those on Soviet charter and 11 % by vessels engaged in the carrying trade from the Continent. The remaining income was derived from activities in the Australian, North American, Danubian and other markets. Tramp ships are noted for their pioneer character in seeking new markets, and have lately shown considerable enterprise in Far Eastern waters. Of the gross amount of foreign currency earned by Greek ships in any year, about 80 % is paid out in foreign countries for supplies, port dues, unloading expenses, repairs and insurance. The net amount of foreign currency entering Greece, representing the net profits of owners and wages of crews, is thus about 20 % of the gross earnings. The largest items in shipping expenses for Greek owners are loading and unloading charges, crew's wages, insurance and outlay for fuel. The gross freight earnings of Greek shipping in 1937 exceeded those of the previous year by over 40 %, and it is estimated that Greece gained in foreign exchange some 25 million gold francs. The net earnings of the mercantile marine abroad in 1938 amounted to over 31 million gold francs, but this was offset by purchases of ships abroad totalling some 29 million gold francs. These were the highest net earnings since 1931 and were achieved in spite of a rise of 20 % in the proportion of the merchant fleet lying idle and a drop of 21 % in the freight index compared with 1937. It is estimated that between 1933 and 1938 the gross income from the mercantile marine increased by 61 %, while between 1935 and 1938 there was an increase of 85 % in the foreign currency entering the country (net earnings) from Greek shipping activity.

Laid-up Shipping

Owing to the seasonal nature of many of the cargoes carried by Greek vessels, any annual figure of laid-up tonnage taken at the beginning or end of the year would give an entirely unbalanced picture; hence the usual method is to give the average percentage for each month throughout the year. The highest figure recorded since

the world economic depression was that of 1938, when the average was 20 %; some 11 % of the cargo ships were affected and 35 % of the passenger vessels. The percentage of laid-up passenger ships has been consistently higher. The lowest average for the whole fleet was 3·62 % in 1937, when only 2·59 % of the cargo tonnage was laid up. These figures mask considerable variations from month to month; for instance, on 31 March 1936, laid-up tonnage rose to a figure unequalled since 1932—94 vessels totalling 288,296 tons. The degree of recovery during the year, however, is shown by the following quarterly returns: 60 vessels of 200,751 tons on 30 June, 21 vessels of 74,477 tons on 30 September and 12 of 37,927 tons on 31 December. Vessels may be idle for periods up to eight months and may stay at Piraiévs between November and May. At River Plate ports they are often laid-up when the Argentine grain crops fail or are very poor; in 1938 the crop failures caused a diversion of tonnage to Australian and other markets.

Conditions since 1941

The Axis acquired 180 ships of over 100 tons gross as a result of the occupation of Greece in April 1941. Many of them were obtained by forced purchase from Greek shipowners or by expropriation The vessels had a combined gross tonnage of 169,971. Of this total, there were forty-two vessels, totalling 31,107 tons gross, which had passenger certificates, and with the exception of two vessels they were all coal-fired. In addition, there were 132 cargo vessels of 127,148 tons gross without passenger certificates. Fifty-three vessels aggregating 8,797 tons gross were Diesel-driven, seventy-three totalling 99,179 tons gross were coal-fired, and the remainder were oil-burning steamers. Six tankers of 11,716 tons gross were also seized. All these ships formed a substantial addition to Axis shipping resources in the Mediterranean, on the other hand, shipping became more and more essential in order to maintain communications in occupied Greece. The passenger vessels were nearly all under 2,000 tons gross and had operated mainly in coastwise services. Most of the cargo vessels were under 3,000 tons gross and of the type trading largely in Greek waters. A considerable proportion of Greek ocean-going cargo vessels were already in the service of the Allies.

Coastwise traffic has maintained its importance since the occupation, especially between the islands and the mainland, and troops

and supplies are chiefly carried in both sail-driven and mechanically-propelled caiques. Small steamers requisitioned from the Greeks are also used occasionally for special purposes such as handling olive crops. Other steamers and motor vessels have kept up fairly frequent services to Kríti. Short-sea traffic has mainly consisted of regular steamer services from Piraiévs, and occasionally Thessaloníki, to Venice or Trieste. Cargoes of some importance have been zinc concentrates, bauxite and other mineral exports from various Greek ports on the route, while in the opposite direction the chief cargoes carried are military stores and general cargo, together with some oil and coal.

Bibliographical Note

(*a*) There is no detailed account published in English of the Greek mercantile marine, but miscellaneous information is published occasionally in shipping periodicals. An account of the effects of the war of 1914–18 on the mercantile marine is published by A. Andréadès, 'La marine marchande grecque et la guerre', pp. 103–27 of *Les Effets Économiques et Sociaux de la Guerre en Grèce*, which forms the Greek section of the *Histoire Économique et Sociale de la Guerre Mondiale* (Publ. de la Dotation Carnegie pour la Paix Internationale, Paris and New Haven, 1928)

(*b*) Statistics relating to the composition of the fleet are available in *Lloyd's Register of Shipping*, 1939–40, vol. III (London, 1939) and to shipping traffic in the *Statistique du mouvement de la navigation pendant l'année* 1938 (Athènes, 1939). *The Annuaire statistique de la Grèce*, 1939 (Athènes, 1940) gives summarized statistics for 1938 and previous years

(*c*) A short account of the economic aspects of the mercantile marine is contained in *The Balkan States*, vol. I, 'Economic', *A Review of the Economic and Financial Development of Albania, Bulgaria, Greece, Roumania, and Yugoslavia since* 1919 (London, 1936).

Chapter VIII

PORTS

Introduction

Major Ports of the Mainland Piraiévs (Piraeus), Thessaloníki (Salonica), Pátrai (Patras), Vólos, Kalámai (Calamata), Kaválla, Alexandroúpolis (Dedéagach), Khalkís (Chalcis), Lávrion (Laurium), Katákolon, Préveza

Major Ports of the Islands. Kérkira (Corfu), Iráklion (Candia), Síros (Ermoúpolis), Khaniá (Canea), Mitilíni, Khíos, Vathí (Sámos)

Minor Ports of the Mainland Kiparissía, Kórinthos (Corinth), Krionéri, Mesolóngion (Missolonghi), Návplion (Nauplia), Pílos (Navarínon Bay); Stilís, Yíthion

The Kórinthos and Levkás Canals

Bibliographical Note

INTRODUCTION

It is not fortuitous that the Mediterranean Sea was the nursery of seamanship, and that as early as the sixth century B.C., Greek colonies were founded as far west as the coasts of Spain and as far east as the shores of the Black Sea. Navigation has always been comparatively easy. For the most part the high coasts fall quickly to deep water close inshore, and the lofty interior of Greece is visible for 60 or 80 miles to seaward. The atmosphere is remarkably clear and fog is rarely experienced. It is true that morning mist is frequent during the summer months, but it is soon dispelled as the sun gains height. Haze, too, may reduce the visibility to less than a mile, but in general, a visibility of less than five miles is regarded as poor. Most winds of gale force occur during winter, when winds strong enough to cause a rough sea in the Aegean blow between north-east and north-west, or between south-east and south-west. In summer, gales are rare and come almost entirely from northerly quarters. In this connexion it is interesting that the ancient Greeks did not go to sea in the winter and that they selected their harbours with a view to the north wind only. hence many of them face south, and are as exposed in the winter as the open sea.

Tides and tidal streams are unimportant, and in those places at which the rise and fall is appreciable, it is regular. The spring rise varies from a few inches in some places to $2\frac{1}{2}$ ft. at others. In the Ionian Sea, a regular inshore current sets northwards along the

coast of Greece, markedly increasing in speed through the channels of the Ionian islands. In the Aegean Sea, currents tend to set southwards, but they are greatly influenced by prevailing winds and are therefore irregular in strength and direction.

The sea provides the natural means of communication in Greece. The mountainous interior of the country, the absence of good roads, the intricate nature of the coastline, the numerous islands of the surrounding seas and the ease of navigation have all been powerful factors in the development of sea transport. The ports of Greece, therefore, are principally concerned with national as opposed to international trade, and their main function is to connect their hinterlands with other parts of the country. By western European standards these ports appear as little more than roadsteads where vessels can anchor and unload into lighters, using their own winches and derricks. In view of the poverty of Greece, these simple facilities have been adequate for the needs of the country; and if the Greek mercantile marine depended entirely on the trade of Greece itself, it would not be the prosperous business that it is (see Chapter VII). Few of the ports have any specialized functions, except those that handle the two leading exports, tobacco and currants. All, however, are dependent on Piraiévs, which supplies them with the bulk of their coastwise imports and handles most of their export trade. Alone among the Greek ports, it has quays at which ships can berth and be unloaded by shore cranes on any significant scale, and it is the only port that has any considerable foreign trade, handling 52 % of the total incoming cargo Thessaloníki, which geographically should be the outlet for the greater part of the southern and western Balkans, exports only 14 % of the total outgoing cargo from Greece.

Innumerable projects have been authorized for the improvement of Greek ports, but many of those on which work had actually started have had to be abandoned owing to the lack of financial support. On the other hand the occupation of Greece since May 1941 has resulted in changes of considerable magnitude. At best, the information on Greek port facilities is conflicting and details of quay measurements and depths are not always reliable.

The *Statistique du mouvement de la navigation*, 1938 (Athènes, 1939) distinguishes fourteen principal ports, for which details are given of foreign and coasting trade (Fig. 38), and a further four ports on the mainland of Greece (Khalkís, Lávrion, Katákolon and Préveza), for which statistics of foreign trade alone are given. These

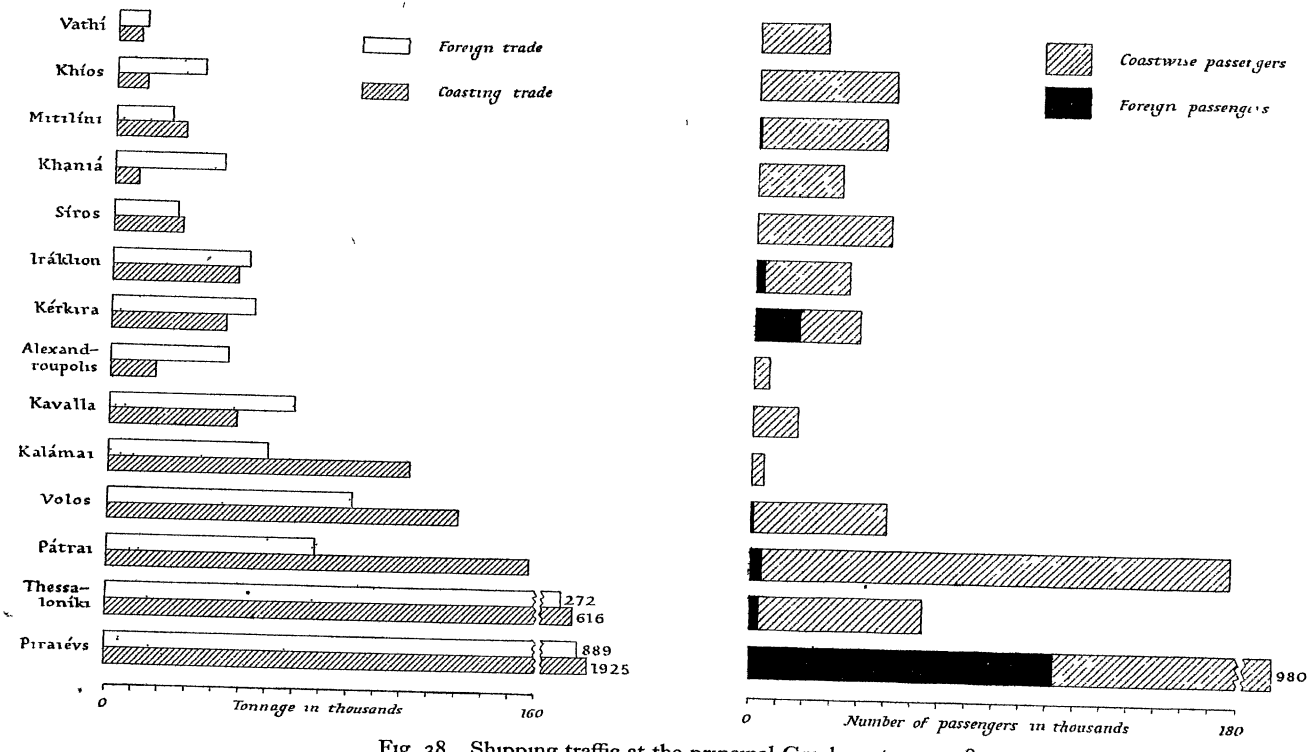


Fig 38 Shipping traffic at the principal Greek ports in 1938

Based on data from *Statistique du mouvement de la navigation pendant l'année* 1938, pp 121–287 *passim* (Athènes, 1939).

The left hand graph shows the relative proportions of cargo relating to foreign trade and that to coastwise trade the right hand graph gives similar information for passenger traffic

ports are described in detail in the following chapter. There are, however, numerous minor ports on the Greek mainland which have considerable local significance, but which have few facilities for

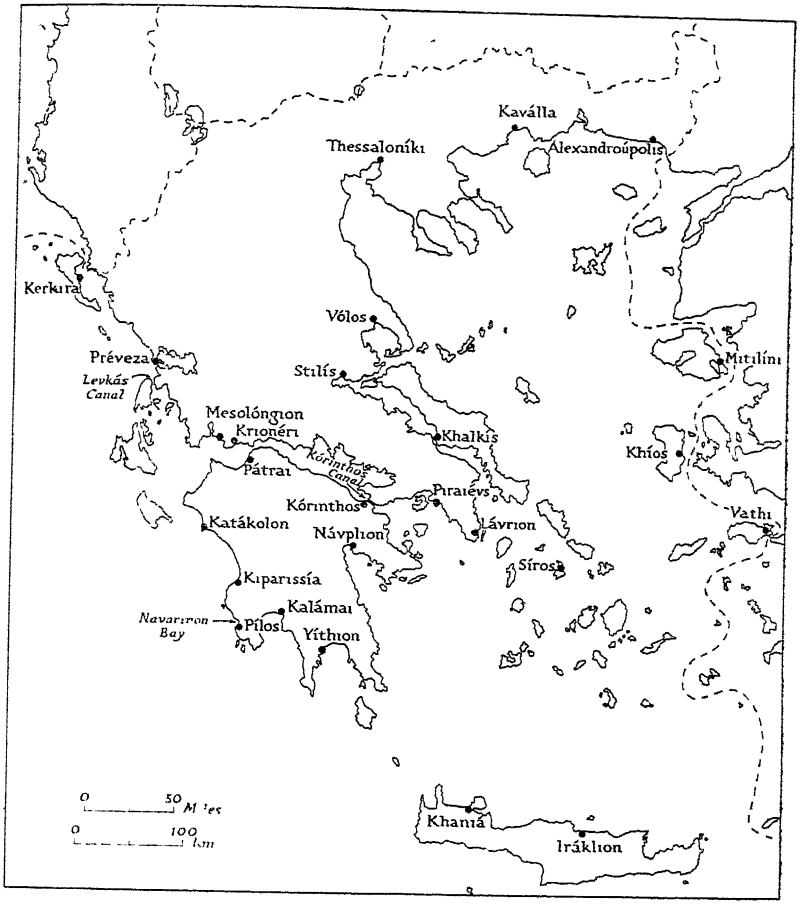


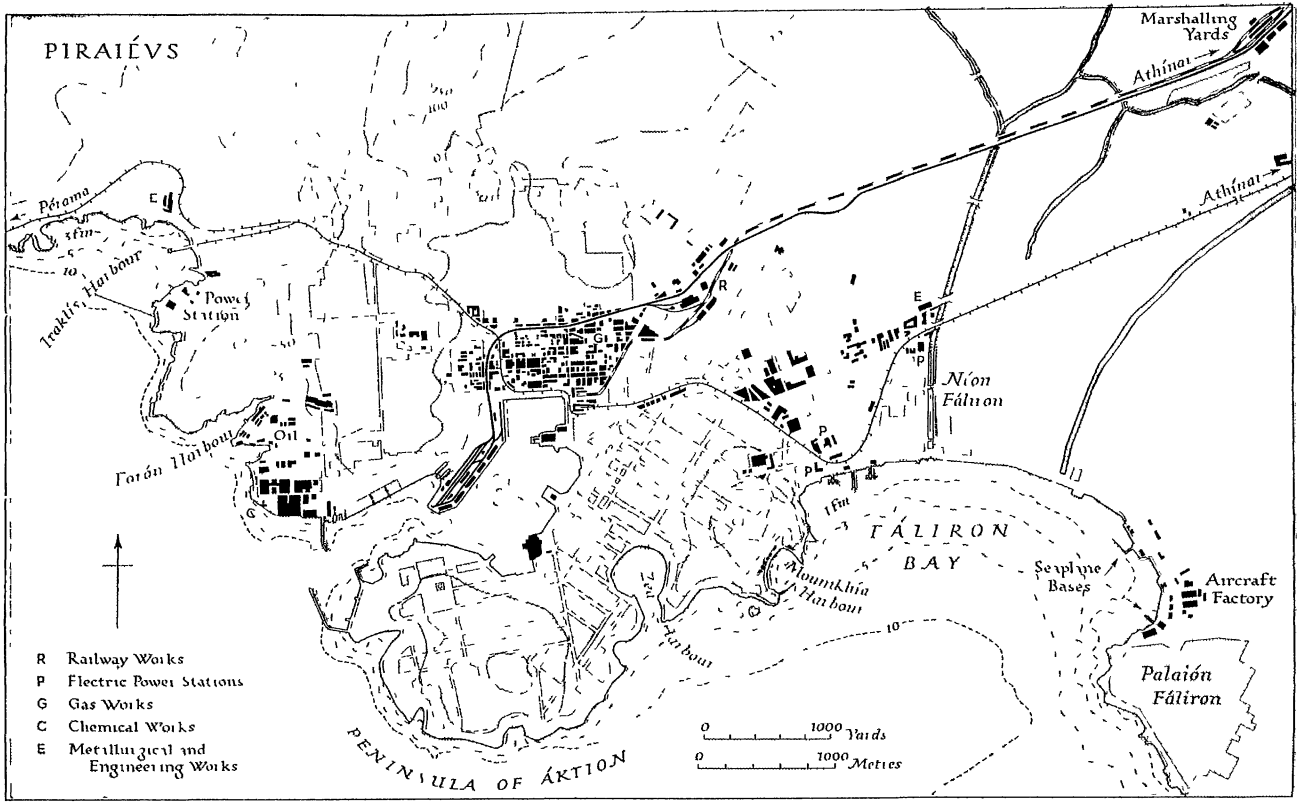
Fig 39. Key map to the principal ports of Greece
The map shows the location of the ports and canals described in the text.

handling large scale traffic and for which there are no available shipping data. The chapter includes a general account of the more prominent of these small ports, and of the only two important waterways in Greece—the Kórinthos Canal and the Levkás Canal (Fig. 39). The minor ports of the Greek islands are described in vol. III of this Handbook.

Shipping Traffic at the Principal Greek Ports, 1938

Port	Entrances				Clearances			
	No of vessels	Net tonnage	Cargo-tons	Passengers	No. of vessels	Net tonnage	Cargo-tons	Passengers
Piraiévs	9,630	6,604,534	2,285,135	540,457	9,440	6,510,860	528,894	551,734
Thessaloníki	2,138	1,472,840	600,471	28,312	2,111	1,468,781	288,009	38,818
Pátrai	3,471	1,844,886	148,455	93,377	3,475	1,845,211	87,801	88,100
Vólos	1,187	820,741	120,642	25,277	1,186	818,853	52,696	25,515
Kalámai	696	382,114	101,979	1,999	696	382,114	70,591	2,646
Kaválla	732	279,961	91,784	8,524	732	279,961	25,959	8,380
Alexandroúpolis	428	159,239	33,004	1,538	428	159,239	28,625	4,081
Kérkira	982	725,707	68,672	27,790	983	725,745	27,905	27,342
Iráklion	814	578,745	51,603	18,927	814	578,745	47,184	18,394
Síros	1,072	487,359	41,680	22,571	1,070	485,170	8,548	27,480
Khaniá	606	304,898	32,863	15,343	606	304,898	17,462	15,688
Mitilíni	640	277,137	18,566	21,234	640	277,137	29,526	26,602
Khíos	1,256	450,382	31,782	24,879	1,256	450,382	13,440	25,568
Vathí (Sámos)	404	169,799	10,472	7,097	406	169,904	8,932	6,851
Other ports	17,875	5,252,261	507,570	174,938	17,888	5,251,861	1,072,474	192,976
Total	41,931	19,810,603	4,135,106	1,012,263	41,731	19,708,861	2,308,046	1,060,175

Source *Statistique du mouvement de la navigation pendant l'année* 1938, pp 121–298 *passim* (Athènes, 1939).


PIRAIÉVS
Marshalling Yards
Athínai
Athínai
Póramo
Trokhitís Harbour
Power Station
Oil
Oil
Forón Harbour
Nían Fáliron
FÁLIRON BAY
Seaplane Bases
Aircraft Factory
Moumkhára Harbour
Zea Harbour
Palaión Fáliron
PENINSULA OF ÁKTION
R Railway Works
P Electric Power Stations
G Gas Works
C Chemical Works
E Metallurgical and Engineering Works
0 1000 Yards
0 1000 Metres

MAJOR PORTS OF THE MAINLAND

Piraiévs (Piraeus)

37° 57′ N., 23° 38′ E. Population 287,800*

Piraiévs is the second city of Greece and by far the greatest port. It is the port of Athens, which is only some five miles to the north-east. Lying on the routes between the western Mediterranean, the Black Sea, and the Suez Canal, it has become a port of call for many foreign lines. It has captured much of the Near East transit trade from İstanbul, while in recent years the tonnage of Italian shipping using the port has become very high indeed.

Approach and Access

Piraiévs is on the eastern side of the Saronic Gulf. The harbour lies between the mainland to the north and the small peninsula of Áktion to the west of Fáliron Bay. High ground on the east, north and west gives considerable protection from strong winds and only the most severe weather can prevent ships from entering. There is a tidal rise and fall of only 8 or 9 ins., and although winds may bring about further slight changes in the water level, such changes do not materially affect the working of the port. The approaches are deep enough for all vessels, but, owing to the difficulty of manoeuvring within the port, passenger liners of over 10,000 tons usually anchor in Fáliron Bay to the east of the main harbour. There are also two anchorages for small vessels on the west side of this bay, the Zéa Harbour (Passalimáni) and the Mounikhía Harbour (Tourkolímano). Immediately west of Piraiévs there are oiling facilities at Forón Harbour (Dhrapetsóna) and at Pérama. A mile or so to the west of the town is the recently developed industrial area of Iraklís Harbour (St George's Bay). These minor harbours are described in detail on pp. 233–6.

Detailed Description (Figs. 40 and 41; Plates 44–51)

The main harbour consists of three basins opening from the sea, with a combined water area of some 500 acres. The Outer or Léon Harbour is used principally by vessels laid up or undergoing minor repairs; the Central, or Mégas, Harbour is used by most cargo and

* The population figures are Greek estimates for 31 12.37, published in the *Bulletin mensuel de statistique, Décembre* 1939, p 719 (Athènes, 1940).

passenger ships; and the Inner, Kofós or Alón Harbour is allotted to sailing ships and small coasting vessels. The Outer Harbour lies at the western end of the port and is protected by two breakwaters, the entrance between which is some 650 ft. wide Vasilévs Yeóryios breakwater extends southwards from the north-west corner of the harbour for 500 ft., and then turns south-east for an additional 300 ft.; Themistoklís breakwater extends westwards for approximately 400 ft., and then turns sharply north-north-west for 1,100 ft. Depths in the Outer Harbour vary between 42 and 89 ft. in the central part, but towards the undeveloped south-eastern part the water shoals to less than 18 ft. A dredged channel more than 60 ft. deep leads through the Outer into the Central Harbour.

The Central Harbour is rectangular in shape and all its sides are quayed. It is approximately 3,100 ft. long by 2,400 ft. wide, with central depths of from 20 ft to over 50 ft., though on the south-west the water is only deep enough for sailing vessels and lighters of shallow draft

The Inner Harbour (Plate 46) lies to the north of the Central Harbour and measures 1,500 ft. by 900 ft. It has a dredged depth of 29 ft. on its western side and 26 ft. on the east.

Until 1923 the only quays in the port of Piraiévs were those on the east side of the Central Harbour and those surrounding the Inner Harbour. Together, they totalled almost one mile in length. By the end of 1930, quays faced with cement blocks had been constructed on the north side of the Outer Harbour and on the north-west side of the Central Harbour, while wharves were under construction on the south side of the Inner Harbour. The total quay length was thereby extended to three miles. It is estimated that when all the extension proposals are completed, more particularly in Fáliron Bay and Iraklís Harbour, the total quay length will be about five miles.

Details of the position, length, depth of water alongside, and the function of the various quays in the main harbour are given in the table on p. 231.

Port Facilities

Five two-storied warehouses with a total floor area of over 200,000 sq. ft. have been built along the north-western quay of the Central Harbour (Plate 48). They are concrete structures and goods can be unloaded directly from the ships' holds into the first or second floors. Each warehouse is provided with interior electric elevators of

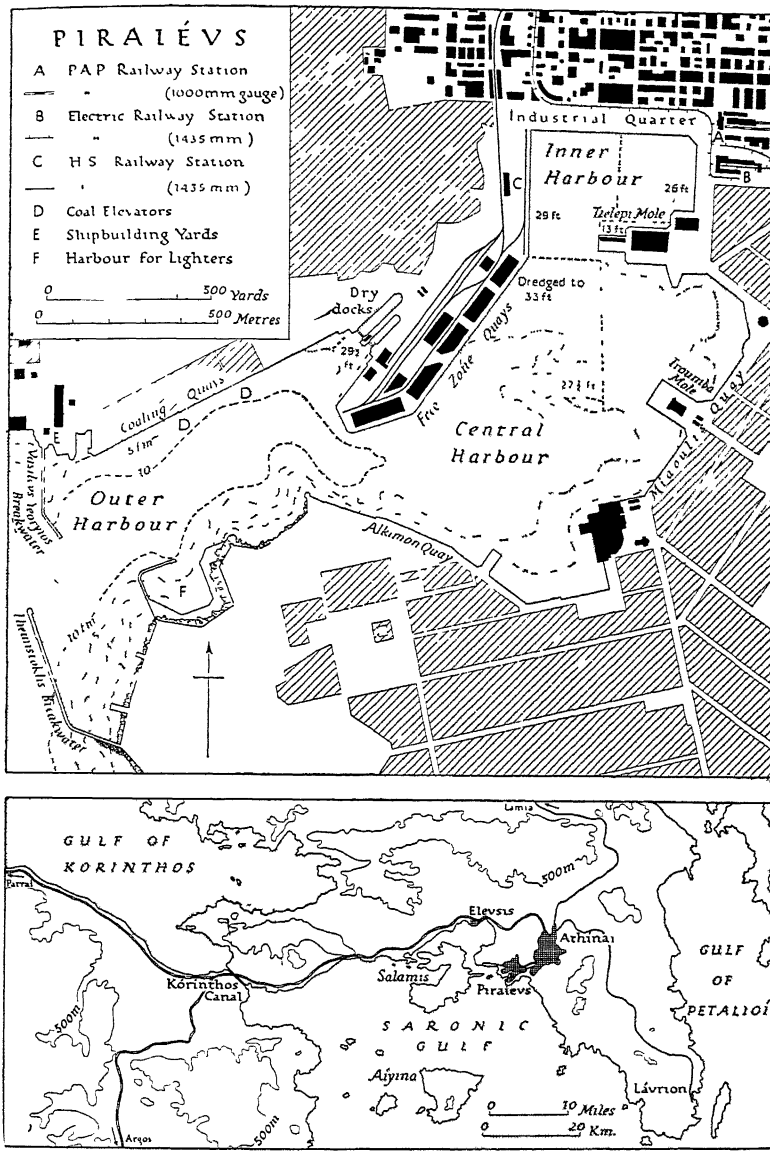


Fig 41 Piraiévs (Piraeus) the Inner, Central and Outer Harbours, and the location of the port

The black shading represents the built-up area and also in succeeding port plans Standard symbols are used for railways of a particular gauge in each port plan

Details of Quays in Piraiévs Harbour

Name of Quay	Position	Length (ft)	Depth (ft)	Function
Coaling Quays (Kandárou Quay)	N side of Outer Harbour	1,475 1,100	33 33	Coaling, Livestock, Building materials
Mole (Grain Quay)	N. side, between Outer and Central Harbours	On N.W 560 On W. 230 On S 590	33 33 33	Grain and general cargo
Free Zone Quays	N W. side of Central Harbour	1,745	33	General cargo
Alón Harbour Quays	W side of Inner Harbour N side of Inner Harbour E. side of Inner Harbour	1,140 1,510 490	29 26–29 26	Anchorage for lighters and small vessels
Tzelepí Mole	E. side between Inner and Central Harbours	On N. 350 On S. 350	13–26 2–19	General cargo, warehouses
Posidhónos Quay	E. side of Central Harbour	300	18	General cargo
Miaoúlis Quay	S.E. side of Central Harbour, along town waterfront	500	On N. 10 On S. 18	Customs House Harbour-master's and health office
Troúmba or Vasílissa Sofía Mole	N.W Projection from Miaoúlis Quay	490	23–26	
Alkímon Quay and Mole	S. side of Central Harbour	2,475	1–13	
Port aux Mahonnes	S side of Outer Harbour	1,635 (total)	at entrance 30 shallows to 3	Anchorage for lighters and barges

two tons capacity and is fitted on the landward side with chutes for the discharge of goods. The harbour development scheme of 1923 proposed the building of three further warehouses on the western quay of the Inner Harbour, as soon as the main international railway station has been removed to the north-west side of the trapezoidal mole As yet these changes have not been carried out. A range of six-floor warehouses for bonded stores is to be built immediately behind the existing and proposed warehouses. A double-track railway has been laid along the quay between the warehouses and the waterside, thus connecting this part of the harbour with both railways leaving Piraiévs for the interior of the country. A modern grain elevator of reinforced concrete, with a storage capacity of some 20,000 tons, has been built on the north-eastern corner of the Outer Harbour, near the dry docks (Plate 50). With its accessory buildings it occupies a frontage of 460 ft.; the depth of water is 33 ft. and vessels of 10,000 tons can berth alongside. Grain can be discharged shorewards by means of pneumatic suction apparatus at the rate of 200 tons an hour, and for the efficient handling of grain cargoes Piraiévs is fully equal to any port in the Mediterranean.

The north-western quay of the Central Harbour is at present the only quay fitted with cranes (Plate 49). It has seventeen electric portal travelling cranes, each of two tons capacity, and four of five tons capacity. Apart from these the port also possesses three floating pontoon cranes, and five small cranes, of negligible capacity, on the quay on the inner side of the Vasilévs Yeóryios breakwater. There are 42 tugs and about 800 lighters available in the harbour, though many of these are unseaworthy and the opening of the new additions to the port has rendered a large number superfluous. The small harbour of Port aux Mahonnes (500 ft. long by 400 ft. wide) has been constructed on the south side of the Outer Harbour for the use of these lighters, thereby increasing the space available for the manoeuvring of larger vessels.

General repairs can be carried out in the two dry docks in the north-west corner of the Outer Harbour. The larger dock is 479 ft. long and 86 ft. 6 in. wide at the entrance, with a depth of 29 ft. 2 in. on the sill; the smaller measures 336 ft. by 51 ft. and has a depth of 25 ft. 7 in. on the sill. The only steel shipbuilding yard in Greece (see p. 131) is in the north-west corner of this harbour, where there is a building slip for ships of 200 ft. and a patent slip 612 ft. long for ships of 2,000 tons. Several firms can undertake major repairs, and additional repair facilities are available at the Greek naval arsenals

at Salamís Bay and at Skaramangá Bay, about 6 miles to the west. The government dockyard at Salamís is on the north-east coast of the island, where there are two floating docks. The larger of the two has a lifting capacity of 3,000 tons, an extreme length of 360 ft. 8 in., a breadth of entrance of 71 ft. and a sill depth of 25 ft.; the smaller has a lifting capacity of 1,400 tons, an extreme length of 308 ft., and a breadth of entrance of 57 ft. 6 in.

The average stocks of coal in Piraiévs Outer Harbour normally amount to 13,000 tons, which are located chiefly on the coal quay and in lighters. The coal quay is fitted with two electrically-driven grab operators, each of which can deal with 120–150 tons of coal per hour. When these are not available bunkering is effected at anchor by lighters, and the bunkering rate falls to 50–70 tons per hour. Vessels can also be bunkered in Fáliron Bay.

Fáliron Bay

The broad bay of Fáliron lies to the east of the main harbour, and, although exposed to the sea, affords good anchorage in 12 fathoms for large passenger and naval vessels. All landings must be made at the landing pier, where there is sufficient depth for picket boats on either side of the pierhead. There is, however, a small landing stage about one mile to the east. On the eastern side of the bay are the civil seaplane base, and, 800 yards to the south, the Greek Naval Air station. With the rapid industrialization of the Piraiévs district the town of Néon Fáliron has grown up along the northern shores of the bay, and there is now almost a continuous city from Piraiévs on the west to the old town of Palaión Fáliron on the east.

Mounikhía Harbour (Plate 123)

The almost circular harbour of Mounikhía or Tourkolímano, on the western side of Fáliron Bay, is some 1,050 ft. from north to south and 750 ft. from east to west. It is entered between two small peninsulas between which there is an effective entrance of some 120 ft. with a depth of 29 ft. In the central part of the harbour the depths vary from 7 to 19 ft. Several piers and jetties project from the shore, the most important of which is a masonry jetty about 100 ft. long.

Zéa Harbour

This small and nearly circular harbour, known also as Passalimáni, lies on the eastern side of the Áktion peninsula. It is approximately

1,350 ft. in diameter and has an entrance channel 600 ft. long from south to north, with a least width of 300 ft. Depths at the entrance are from 10 to 29 ft., but inside the harbour they decrease rapidly. The sides of the harbour are surrounded by stone-faced quays, but shoal water restricts their use to small fishing vessels and yachts.

Forón Harbour

Forón Harbour, or Dhrapetsóna, is the largest petroleum port in Greece, and is formed by two narrow inlets just to the north of the main harbour of Piraiévs. The northern one is 640 ft. wide at the entrance, but narrows rapidly to the north-east; the southern one is only 420 ft. wide, and does not extend so far inland. The headland between the inlets and part of the north shore is occupied by oil storage depots, and the harbour is entirely surrounded by oil installations, chemical works (see p. 124), and a cement factory. As yet, however, there are no rail connexions with any of the quays owned by the various companies. Vessels can refuel, either alongside the oiling wharves or lying at anchor, by tank vessel or floating pipe line. A stone tower, fitted with oil pumps, has been erected off the eastern shore of the northern inlet; the following tables show the various quay facilities:

Details of Quays in the Northern Inlet

	Length (ft)	Width (ft)	Berthing space (ft.)	Depth alongside (ft.)
West Jetty	100	40	240	0–20
Socony Oil Wharf	200	40	240	11–20
Socony Oil Pier	48	20	550	0–20
Socombel Pier	90	20	250	0–18
Shell Oil Pier	60	20	250	0–22

Details of Quays in the Southern Inlet

Chemical Works Quay	275	150 × 125	550	7–16
?	70	?	70	?

The oil installation, principally concerned with White and Black oils imported from Roumania and the Netherlands East Indies, has an associated tin factory, which manufactures about 5,000 four-Imperial gallon tins a day. The table on p. 235 gives details of the total tankage of the firms operating at Forón in 1940.

Petroleum Tanks and Storage Capacities at Forón

Companies	Benzine		Kerosine		Gas Oil	
	No of Tanks	Total Cap	No of Tanks	Total Cap	No of Tanks	Total Cap.
Shell	10	502 5	3	172 6	—	—
Steaua Romana and Socombel	2	84 7	4	169 5	—	—
Socony-Vacuum Corporation	5	158 9	1	197 8	3	203·6
Total	17	746 1	8	539 9	3	203 6

Companies	Lubricating Oils		Unspecified		Total	
	No of Tanks	Total Cap.	No of Tanks	Total Cap.	No. of Tanks	Total Cap
Shell	5	1·7	3	28 2	21	705 0
Steaua Romana and Socombel	—	—	3	5 3	9	259·5
Socony-Vacuum Corporation	2	84 0	—	—	11	644 3
Total	7	85 7	6	33 5	41	1,608 8

From official sources.
The figures are to the nearest 1,000 cu ft. (=6,228 Imperial gallons) Benzine includes aviation and motor spirit.

Iraklís Harbour (Plate 40)

The small artificial harbour, known also as St George's, lies at the eastern end of Salamís Strait, about 2,000 yards north-west of Piraiévs Harbour. It has an area of 1,100 by 850 yards and it was intended to develop the harbour for industrial purposes. As yet the projected development is far from complete. The harbour is protected on the south-west by a breakwater, 18 ft. wide, extending west-north-west for some 1,800 ft., leaving an entrance with a minimum width of 1,500 ft. A power plant, a flour mill, and an iron foundry have wharf facilities. There is also a large railway pier, carrying lines from the main Piraiévs area. The grain pier has an elevator equipped with pneumatic unloading appliances and has a daily capacity of 150–200 tons. Details of lengths, depths alongside, and functions of the various quays are given in the table on p. 236.

Pérama Harbour

The small harbour at Pérama lies on the northern shores of Salamís Strait. Vessels can fuel by pipe line and can be moored stern-to at the head of a pier in depths of 32 ft. The pier is 400 ft. by 20 ft.

Details of Quays at Iraklís Harbour

Name	Length (ft)	Width (ft)	Berthing space (ft)	Depth alongside (ft)	Remarks
Iron Foundry Quay	225	85	200	6	
Railway Jetty	660	85	1,405	0–16	carries 4 trucks
East Jetty	440	90	970	0–13	storage buildings
Grain Pier	300	—	—	7–13	grain elevator and flour mills
Coal Wharf	35	165	165	26	1 elec derrick 2 elec. cranes 2 elec belt conveyors
Breakwater	1,800	18	1,800	26–70	masonry on rubble foundation

and has a berthing space of 620 ft. There is also a small pier to the east, with a crane of 2 tons lifting capacity. The oil installations, concerned with Black oil, are owned by the Shell Oil Company, and consist of nine storage tanks with a total capacity of just under 1,500,000 cu. ft.

The Town

The town of Piraiévs almost surrounds the harbour: to the south of the entrance, the eastern part of the peninsula of Áktion is built upon, but the western and steeper part is mostly free of buildings, and the north-western portion is a public garden. From the peninsula the town spreads eastwards along the northern shores of Fáliron Bay, and to the north it rounds the Inner or Kofós Harbour. It thus covers to a remarkable extent the area which the ancient Piraeus enclosed within its walls, and its streets in fact largely follow the lines of the town geometrically planned in the fifth century B.C. The quite recent growth of factories (see p. 104) has now covered the formerly agricultural land between Piraiévs and Athens, so that the old distinction between them is becoming rapidly lost, and Athens and its port are, in fact, one city.

In the purely modern and widely-built town of Piraiévs there is little of antiquarian interest, but the slipways of the triremes of the ancient fleet may be seen in the harbours of Zéa and Mounikhía (see

vol. I, p. 442). Public buildings include an Exchange, the customs-house, the general and naval hospitals to the south-west of Zéa Harbour, and an orphanage close to the public gardens. The modern church of Áyios Ilías is on the slope of the hill Mounikhía, and at some 200 ft. below the surface of this hill is a series of ancient subterranean reservoirs, reached by 165 steps.

Piraiévs is a demarchy: judicially, it is the seat of a Court of the First Instance (belonging to the Court of Appeal at Athens), of a Court of a Justice of the Peace, of a Police Court, and of the one Maritime Court for the whole of Greece. Its police form divisions of the *Astinomía* of Athens: it is a garrison town and military head-quarters, with stores and a branch office of the National Inspectorate of Military Stores. It has a motorized fire brigade under the direction of Athens. Its naval and marine functions include a Harbour Master's Office, the inspection of merchant shipping (under the Direction of Merchant Marine in Athens), a lighthouse base, hydrographic and harbour wireless telegraphy services, and the control of the pilot service. It has three telephone exchanges. Educationally, it is an administrative centre for secondary schools, and for primary schools is a district in itself. Its nautical colleges are important: one is for the Navy, another for the merchant service; and there are two night-schools for engineers. Piraiévs possesses a library of 25,000 volumes and a small museum in the Odhós Filellínon.

History

The growth of Piraiévs is recent, and has been directly due to the development of Athens after it had been established as the capital of the new kingdom of Greece in 1834. In classical times the possession of the port was the basis of the sea power of Athens, and even at this early period elaborate works were undertaken to equip the port for shipping and to traverse the marshes that cut off the coast from the interior. After its destruction by Sulla in 86 B.C. it became no more than a mere village, and so remained for centuries. From 1834 onwards, however, growth was rapid and the town began to enjoy a new period of prosperity. The coming of steamships showed the existing and rather primitive port facilities to be inadequate, and in 1902 enlargements were made and the present breakwaters were constructed. In 1923 further additions to the port were authorized, but work did not start until some five years later. These new works included the reconstruction of the north side of the Outer Harbour, the construction of the two dry docks, the installation of the grain

elevator and coaling plant, and the improvement of facilities on the north-west side of the Central Harbour and on the west side of the Inner Basin. At the same time a special Harbour Board was established to supervise the administration of the port. Besides the improvements in the port of Piraiévs itself, the Board has turned its attention to the development of the nearby Iraklís Harbour, a mile or so to the west of the town, where a breakwater of 1,800 ft. has already been built and some 6,900 ft. of quays are scheduled to be constructed.

Trade

The most outstanding feature of the trade of Piraiévs is the great disproportion between the tonnage of imports and exports, a characteristic clearly illustrated in the following table:

Trade in 1938 (*thousands of m. tons*)

IMPORTS			EXPORTS		
FOODSTUFFS		517·3	FOODSTUFFS		111·5
Wheat	283·6		Flour	56·7	
Other cereals	60·7		Wheat and other cereals	21·9	
Fruit and vegetables	81·1		Fruit and vegetables	16·8	
Fish and fish products	27·6		Fish products	4·1	
Sugar and molasses	41·8		Sugar	3·3	
Tea, coffee and cocoa	6·1		Miscellaneous	8·7	
Livestock products	8·8				
Miscellaneous	7·6				
OIL SEEDS, VEGETABLE AND OLIVE OILS		56·0	OIL SEEDS, VEGETABLE AND OLIVE OILS		5·6
FUELS		935·1	FUELS		364·5
Coal, coke, anthracite	666·1		Coal, coke, anthracite	258·8	
Benzine	58·3		Benzine	14·2	
Naphtha and petroleum	194·1		Naphtha and petroleum	87·9	
Coal tar, greases, oils	16·6		Coal tar, greases, oils	3·6	
TIMBER AND WOOD PRODUCTS		123·4	TIMBER AND WOOD PRODUCTS		20·4
CHEMICAL MATERIALS		136·5	CHEMICAL MATERIALS		93·0
Chemical fertilizers	61·7		Chemical fertilizers	79·9	
Other chemical products	68·5		Other chemical products	11·2	
Soaps and perfumes	3·9		Soaps and perfumes	1·9	
Paints and dyes	2·4				
CHINA AND GLASS		9·5	CHINA AND GLASS		16·1
IRON AND STEEL GOODS		112·7	IRON AND STEEL GOODS		20·9
CLAYS, CEMENTS AND BUILDING MATERIALS		279·0	CLAYS, CEMENTS AND BUILDING MATERIALS		56·6
PAPER AND PRINTED MATTER		20·3	PAPER AND PRINTED MATTER		4·1
TEXTILES		18·0	TEXTILES		6·0
MISCELLANEOUS		54·6	MISCELLANEOUS		76·0
TOTAL		2,262·4	TOTAL		774·7

Source: *Statistique du mouvement maritime et commercial*, 1938, *Administration du port du Pirée*, pp 20–1 (Athènes, 1939).

Imports come from many sources, but until very recently Great Britain provided the bulk of the imported minerals, machinery and raw materials. In the years immediately before the outbreak of war, Germany was capturing more and more of this trade, and Great Britain was gradually being ousted from its position as the chief supplier. Practically the entire importation of coal comes from Germany, except for a little Welsh steam coal, and some bunkering coal from the U.S.S.R., while petroleum imports are derived from Roumania and to a lesser extent from the Netherlands East Indies and the United States. The statistics make it fairly clear that some of the imports are re-exported, and in fact one of the chief functions of the port is to supply other Greek ports with foodstuffs, fuel and miscellaneous goods. Thus one-third of the net tonnage passing through the port is engaged in the coasting trade, and Piraiévs has frequent shipping connexions with all other ports of Greece, as well as being a port of call for many foreign lines. In 1938 the total tonnage entering and clearing the port was some 13·1 million tons, 3·4 million tons representing Greek vessels engaged in the coasting trade (see table on p. 240). A feature of some importance is the growing number of American vessels using the port. Passenger traffic is very considerable, about one million passengers using the port annually, but only one-tenth of this number is made up of travellers coming from or proceeding to foreign countries.

Industry

Piraiévs is the chief industrial centre of Greece and has a number of large factories, most of which have originated in the last twenty years. These are mainly concerned with the working up of agricultural produce, and include brewing, distilling, sugar refining and the manufacture of tobacco. It also has large chemical works, soap factories, carpet and textile mills, and some light engineering and metallurgical works. Electric power is supplied by the *Electric Light Company of Athens and Piraiévs*, which operates two large steam turbine generator plants, with a combined capacity of 75,000 kW. The industrial raw materials that are not re-exported to other parts of Greece mainly find their way to the factories of Piraiévs, or are sent on to Athens.

Communications

The communications between the port of Piraiévs and its hinterland are certainly better than exist elsewhere in Greece, but even so

Piraiévs—Shipping Traffic, 1938

Traffic Category	Entrances						Clearances					
	Laden				In ballast		Laden				In ballast	
	No. of vessels	Net tonnage	Cargo –tons	Passen-gers	No. of vessels	Net tonnage	No of vessels	Net tonnage	Cargo –tons	Passen-gers	No of vessels	Net tonnage
Steamers												
Foreign	1,860	3,920,676	1,439,352	69,604	69	115,080	1,128	2,742,410	115,911	58,152	509	768,815
Calling—Foreign	477	680,864	314,285	6,156	112	157,182	484	717,938	41,480	6,574	387	609,067
Coasting	4,042	1,569,117	299,571	464,699	34	10,725	3,873	1,449,559	170,944	487,007	189	82,189
Sailing Vessels												
Foreign	125	7,459	8,563	—	—	—	5	695	920	1	16	2,361
Calling—Foreign	54	4,804	4,397	—	1	104	—	—	—	—	—	—
Coasting	2,548	123,312	218,967	—	308	15,211	2,363	113,737	199,639	—	486	24,089

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp 238–41 *passim* (Athènes, 1939)

For an explanation of Calling—Foreign traffic, see p. 211.

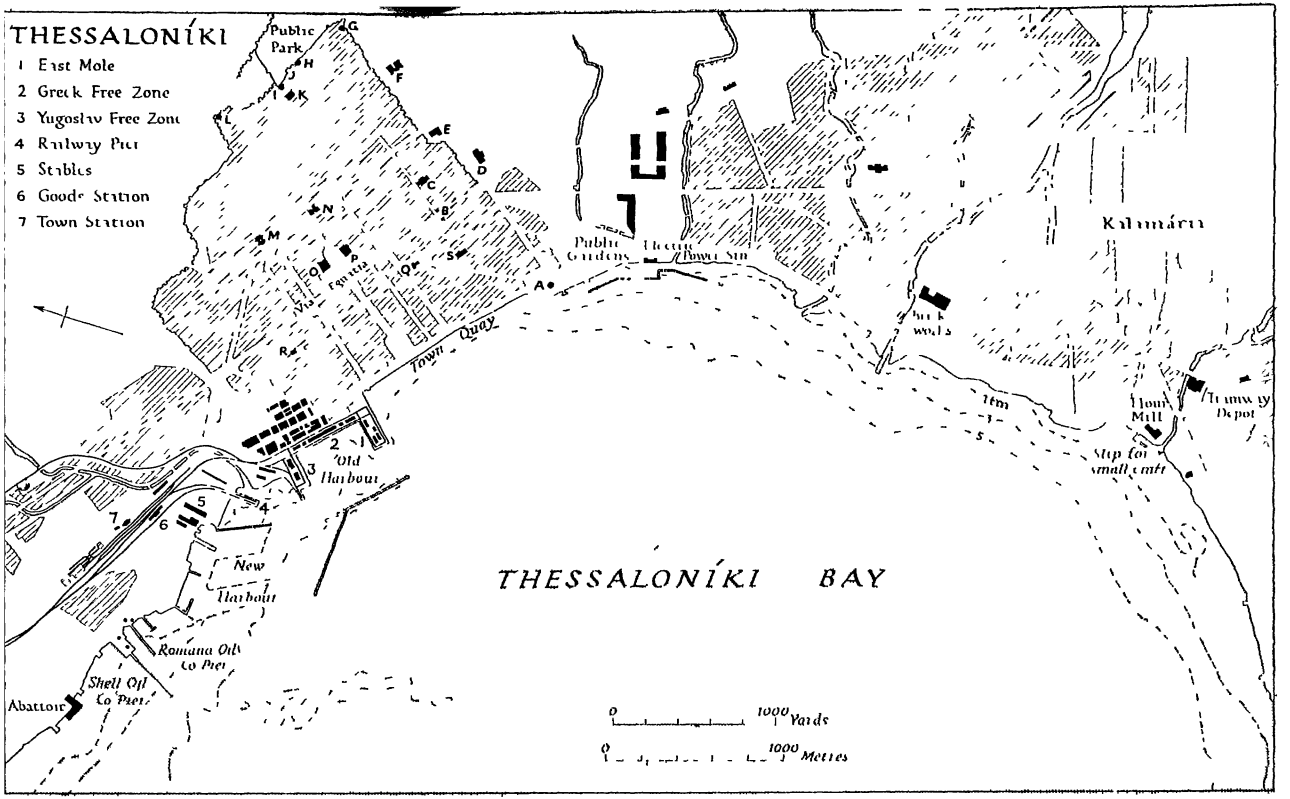


Fig 42 The port of Thessaloníki (Salonica)

There are a number of industrial establishments near the New Harbour and the oil piers, including soap and textile factories, breweries and tanneries

A White Tower (*Levkós Pírgos*), B Arch of Galerius, C St George's Church, D Military Hospital, G *Gingirli-koulé*, H Tower of Andrónikos Palaiológos, I Tower of Palaiologos, J Secret Postern, K *ton Vlation*, L Tower of Manuel Palaiologos, M *Dhikitírion*, N St Demetrius' Church, O *Dhimarkhion* (Town Hall), P *Dhikastírion* (Law Courts), Q St Sophia's Church, R Roman Catholic Church, S Market

they are very poorly developed. Two reasonably good highways connect the port with the capital, one direct, and one via Palaión Fáliron. A third road leads westwards to Pérama (where there is a ferry to Salamís) and then on to Skaramangá and Elevsís. The port is also the terminus of three railways. One of these is the electrified double-track line from Piraiévs to Athens, which runs for some distance underground on reaching the capital. This line carries more passengers annually than all the other Greek lines put together. The other two lines are the Piraiévs-Athínai-Pelopónnisos (P.A.P.) line, and the Piraiévs-Athens-Thessaloníki railway. Both are single track, the former of metre gauge and the latter of standard gauge. The Piraiévs-Athens-Thessaloníki line is connected by means of an electrified track with the tram system of Athens and the Piraiévs-Athens electric railway. The combined yards of the Piraiévs-Athens-Thessaloníki and the P.A.P railways, about one mile north-east of Kofós Harbour, have locomotive repair shops. It must be remembered, however, that throughout the whole of Greece all heavy goods and stores are dispatched by coasting vessels, and the railways deal chiefly with passenger traffic and valuable freight.

Thessaloníki (Salonica)

40° 33′ N., 22° 56′ E. Population 267,870

Thessaloníki is the third largest city of Greece and the third port of the country judged by the total tonnage of shipping entered and cleared. If judged, however, by the amount of cargo handled it is exceeded only by Piraiévs (see table on p. 228). The town lies at the head of Thessaloníki Bay, a northerly extension of the Gulf of Thessaloníki.

Approach and Access

The entrance to the Gulf of Thessaloníki is formed by the narrows between Megálo Karaburnú on the east and Cape Axiós on the west. The western shores of the gulf are low and marshy where the river Axiós is continually forming new mud flats, while on the eastern shores the coast is also low-lying north of Mikró Karaburnú. The mud flats, the shallows off Megálo Karaburnú, and the almost constant mirage over the low, irregular shores have led many ships aground. A further difficulty to navigation is caused by the strong

current that frequently sweeps across the gulf from the mouth of the Axiós.

Within Thessaloníki Bay, good anchorage can be found just outside the harbour in depths of 7–9 fathoms, although immediately south-west of the breakwater there are three shoals where depths are less than 5 fathoms. In winter, loading and discharging operations may be temporarily suspended by stormy north-westerly winds. These blow down the valley of the Axiós, frequently reach gale force and may last for three or four days. In summer the most powerful winds are the Etesians which also blow from the north-west and sometimes reach gale force. The bay is exposed to sea-breezes from the south-west, which usually begin to blow in the early afternoon. At such times discharging operations in the bay are impeded. There are practically no tides, and even spring tides do not exceed 2 ft.

Detailed Description (Fig. 42; Plates 52–5)

The port of Thessaloníki consists mainly of the Old Harbour, which was protected from south-westerly winds by a breakwater some 1,830 ft. long (see below). The eastern and western sides of the harbour are protected by two moles, extending at right angles from a central quay along the town water-front. The small area of water thus partially enclosed is some 1,300 ft. square, with an entrance depth of 37 ft. and a general harbour depth, maintained by dredging, of 33 ft. It can accommodate not more than twelve ocean-going liners of from 3,000 to 5,000 tons.

The total length of berthing quays within the Main Harbour is some 2,600 ft., details of which are given in the following table:

Details of Quays in the Main Harbour of Thessaloníki

Name of Quay	Length (ft)	Width (ft)	Berthing space (ft.)	Depth (ft)	Ht above M W L O.S	Construction	Lifting appliances
Central Quay	c 1,300	150	1,300	18–27	5	masonry blocks on rubble	2 cranes (5 ton) 2 cranes (2½ ton) 2 cranes (1½ ton)
East Mole	c 650	330	1,600	27–28	5	Ditto	1 crane (15 ton)
West Mole	c 650	165	1,420	24–28	5	Ditto	1 crane (5 ton)

The seaward side of the West Mole has been silted up and is only suitable for small craft, but an extension has been added to the western side of the mole, some 165 ft. long and 50 ft. wide Here, and along the inner side, there is sufficient depth for ocean-going ships to berth. Vessels using the moles berth alongside, but ships using the Central Quay are moored with their sterns to the quay and discharge into lighters. Colliers and foreign passenger vessels may moor with their sterns to the breakwater. In 1939 new harbour works were started and some 600 ft. were removed from the north-western end of the breakwater. A new arm, which is to be 2,135 ft. long, branching off from the old breakwater at the point where the section was removed, extends westwards parallel with the shore.

The harbour is divided into three administrative sections, the East Mole which is used by coasting steamers, the Central Quay which is the Greek Free Zone, and the West Mole which constitutes the Jugoslav Free Zone. The completion of the Jugoslav Free Zone in October 1925 was an attempt to provide Jugoslavia with a port on the Aegean. The area is Greek territory under Greek sovereignty, but the control of customs is in the hands of the Jugoslav government for fifty years. As yet the transit trade has not increased the business of the port to any great extent.

To the west of the Main Harbour there are a number of small piers, but for the most part they are of flimsy construction and the depth alongside is insufficient for ocean-going ships.

The following table gives details of these quays from west to east:

Details of Quays to the west of the Main Harbour

Name of Quay	Length (ft)	Head (ft)	Berthing space (ft)	Depth alongside (ft)	Ht above M.W.L. O.S.	Construction
Shell Oil	1,080	100	1,700	4–26	8	T head pier of steel on 8 in pipe piling
Steaua Romana	850	20	1,000	3–16	5	Steel frame on piling
Socombel	300	150	150	3– 6	5	T head iron pier on piling
Socony	850	20	1,600	6–16	5	Steel on piling (?)
New Quays	780 780	—	1,560	33	5	Masonry blocks on rubble base
Railway or Coal Pier	350	60	600	33	6	Timber on piling (?)
Jugoslav Quay	600	—	500	26	5	Masonry blocks on rubble base

It is in this region, to the west of the Old Harbour, that new moles and quays were under construction at the time of the Axis occupation (see dotted lines on Fig. 42). When completed they will provide over 6,000 ft. of berthing quays, with depths alongside of 33 ft.

To the east of the Old Harbour there are further quay facilities, mainly for local needs. These are shown in the following table.

Details of Quays to the East of the Main Harbour

Name of Quay	Length (ft)	Head-width (ft)	Berthing space (ft)	Depth alongside (ft)	Ht above M W L O S.	Function
Town Quay	4,000	—	4,000	9–15	5–9	Fishing and sailing boats
Boat Pier	72	100	244	5	4	Passengers and cargo
Power Station Pier	80	20	160	8	4	Coal (?)
Brickworks Pier	300	15	600	4–10	3	Loading bricks
Small-boat Harbour	150 × 60	—	210	6	4	Repair slipway (?)

Port Facilities

The normal rate of cargo discharge is considerably over 2,000 tons per day, and the intensity of quay use per foot of quay is often very high indeed Almost all the cargo is handled by lighters, of which there are normally some sixty serviceable vessels, with a total capacity of over 2,000 tons There are seven travelling cranes of low lifting capacity and an old travelling crane of 15 tons capacity at the end of the East Mole. The port also possesses two sheer-legs, one of 50 tons, the other of 30 tons. It is proposed that the new port should be equipped with twenty travelling electric cranes of from 2 to 20 tons capacity.

Storage facilities consist of forty-six warehouses in the Greek Free Zone with an area of about 780,000 sq. ft. but with an effective capacity of less than one-third of this total. There are also some recently constructed (1938) cold storage warehouses with a total content of 70,000 cu. ft., capable of holding 700 tons of merchandise. In the Jugoslav Free Zone storage capacity is limited to 65,000 sq. ft. and to a long disused grain silo. Grain steamers now discharge at the Alatini flour mills in the Thessaloníki roads. Thessaloníki is the chief livestock centre of the southern Balkans and has landing stages

Petroleum Tanks and Storage Capacities at Thessaloniki

Companies	Benzine		Kerosine		Gas Oil		Fuel Oil		Unspecified		Total	
	No of Tanks	Total Capacity	No of Tanks	Total Capacity	No of Tanks	Total Capacity	No of Tanks	Total Capacity	No of Tanks	Total Capacity	No. of Tanks	Total Capacity
Shell	3	120 4	3	131 4	2	188 1	2	112·4	—	—	10	552 3
Steaua Romana & Socombel	1	63·8	2	62·7	3	105 7	—	—	—	—	6	232 2
Socony-Vacuum Corporation	1	31 8	2	155 0	2	199 5	—	—	2	5 3	7	391 6
Total	5	216 0	7	349 1	7	493 3	2	112 4	2	5 3	23	1,176 1

From official sources

The figures are to the nearest 1,000 cu ft (=6,228 Imperial gallons)

Lubricating oils, not shown in the table, are imported in drums and repacked into small containers

and stables with an area of 300,000 sq. ft. to deal with the trade in live animals.

Coaling is from lighters by bags and the rate is limited to 10 or 15 tons per hour. The oil installations lie to the west of the Old Harbour, and rank second to those of Forón Harbour (Piraiévs). Each of the three principal importing firms—Shell, Steaua Romana, and Socony-Vacuum Corporation (Standard)—owns a pier on which pipe lines have been laid and at which tankers can moor stern-to (Plate 54). Like those at Forón the installations include a tin factory for making 5,000 four Imperial gallon tins per day. The table above gives details of tankage and storage capacity.

The Town

The town stretches along the Bay of Thessaloníki for more than five miles, but excluding its suburbs it may be regarded as extending, with a fine front, from the port to the Venetian White Tower (*Levkós Pírgos*). The seaward and central part, which suffered in the fire of 1917, has been largely replanned and rebuilt on modern lines; many buildings are four storeys high, but others are of less imposing dimensions and inferior workmanship. It is traversed by the *Odhós El. Venizélou*, running north-east from a square near the port, and,

crossing this at right angles, by the *Via Egnatia* (*Odhós Egnatía*). Enclosing this modern part, and in places still surviving within it, is the ill-planned Turkish town; and this rises to the dubious and ill-policed quarters bordering on the Citadel, with its walls and castle, used as a prison. The ancient walls extend for a distance of several miles round the northern and eastern parts of the town.

The growth of Thessaloníki has of late years been rapid; its importance as a seaport and trading centre has been increased by the arrival of a large number of refugees from Asia Minor, some of whom settled in newly-built quarters in the town itself, and many more in agricultural villages in Makedhonía, which has profited greatly from the draining of its malarious swamps, and whose revolutionized agriculture has greatly enhanced the importance of Thessaloníki. A small alien element in the town consists of Italians, who are reinforced in season by fishermen from Italy (see p. 96). Many Vlachs also have been attracted to the town and have exchanged their nomadic pastoral life for one of settled commerce.

The churches it possesses, of great interest in spite of much irreparable damage in the fire of 1917, are described in vol. I, pp. 444–5. St George's is a landmark by reason of its Roman rotunda and by the survival of the last of the minarets (*tzamía*) of the city. It lies off the *Via Egnatia*, close to the Arch of Galerius which spans that road The only surviving monastery, *ton Vlatíon*, is placed on a rocky height at the western junction of the walls of the citadel and those of the city *enceinte* Towers which are disposed along the walls are *Gingirli-koulé*, a donjon contemporary with the White Tower, at the north-eastern corner of the *enceinte*, the Tower of Palaiológos close to the monastery, that of Andrónikos Palaiológos somewhat to the east of this on the wall of the citadel (the Secret Postern lies between the two) and the Tower of Manuel Palaiológos at the angle of the *enceinte* to the west of the citadel. There is a Roman Catholic church and convent, with hospital and school, in the *Odhós Frángon*, other foreign churches, and some ten synagogues.

Public buildings include the *Dhikatírion*, or seat of government, the *Dhimarkhíon* (Town Hall), and opposite it, in the centre of the city, the *Dhikastírion* (Law Courts). Thessaloníki is the seat of government for Makedhonía, as well as a nomarchy and demarchy, the seat of a bishop (the exarch of Thessalía), of a Roman Catholic bishop and of a Chief Rabbi. Its University was founded in 1925 (see vol. I, p. 303).

The administrative functions of Thessaloníki are very numerous.

Judicially, it maintains a Court of Appeal, a Court of the First Instance, a Justice of the Peace's Court, and a Police Court. The town is the Head of the Gendarmerie both for Makedhonía and for the District of Thessaloníki, and it has its own *Astinomía*. It is also the headquarters of an Army Corps and a garrison town, with barracks and other military establishments.

The hospitals, two military, one municipal and one maintained by the Red Cross Society, are outside the walls to the east. In Kalamária, the airy suburb of superior residences, are a School of Agriculture, a museum in the former mosque Yéni-Tzámi, and many of the foreign consular offices. Kalamária is served by electric trams which run from the railway station along the *Odhós Tzimiski* to the White Tower; an almost parallel tramline serves the whole extent of the *Via Egnatia* within Thessaloníki. The town has had electric lighting for nearly fifty years, and few parts of it are unsupplied.

History

Thessaloníki was founded about 315 B.C. by Cassander, King of Macedonia, and owes its name to his wife Thessalonike, the sister of Alexander the Great. Its position on the *Via Egnatia*, the main line of communication from Rome to the Near East, gave it considerable importance as a commercial and intellectual centre in Roman Macedonia. St Paul preached here and founded the church to which his Epistles to the Thessalonians are addressed. During the Slav invasions of the sixth century and onwards the city withstood assault more than once. Late in the twelfth century it also had to withstand attack by the Normans, who, however, succeeded in plundering it. But in spite of many attacks and invasions Thessaloníki remained a leading market for the eastern trade of the Byzantine empire. For part of the twelfth century it was the capital of the Latin crusader Boniface de Montferrat, but passed back again to Byzantine rule, though greatly subservient to the Genoese and Venetians. In the fourteenth century the first serious Turkish attack was launched, but the town was not finally taken until 1430. From that time on it suffered a commercial decline which lasted into the nineteenth century. New life was nevertheless imparted to the reduced city by the arrival, after their expulsion from Spain and Portugal in 1492, of large numbers of Sephardic Jews whose numerous descendants still speak a form of Spanish called Ladino. Their services both to commerce and to learning have been of great value.

At the time of the Greek revolt in 1821, the liberation of Thessaloníki was a primary object of those who hoped for a Macedonian rising; but an attempt to rise was sternly repressed by Yussef-bey, and the town remained in Turkish hands throughout the nineteenth century. The advent of railways and steamships in the 1870's and 1890's called for improvements to the port, and in December 1901 the present harbour was opened. The Turkish government granted a concession by which the exploitation of the port was ceded for 40 years to the French company which built the harbour: this agreement was later recognized by the Greek government.

In the First Balkan war, Turkey lost control of the town, which was occupied by a combined Greek and Bulgarian army. With the defeat of Bulgaria in the Second Balkan war it passed to Greece, but not to an uneventful period of its history; for it was to see the murder of George I in 1913, the landing of Allied troops in 1915, a grievous fire (one of many) in 1917, and an abortive military rising against the dictator Pangalos in 1926. The Treaty of Bucharest in August 1913, by which Greece obtained Thessaloníki, allowed Serbia to have access to the port, and by a law of 10 May 1914, the Serbian Free Zone was created. The outbreak of war later in the same year prevented the scheme from being put into practice, and from 1915 to 1918 the town was the main base for a vast Allied army operating against Bulgaria and the Central Powers. By the spring of 1917 some 600,000 men were stationed in the district, with units from almost all the Allied nations. Numerous improvements in the harbour and communications were made by the Allies during their occupation. After the war Greek immigrants began to flow into Thessaloníki at an increasing rate, especially after the Smyrna disaster, and it soon became an almost completely Greek city.

Trade

As with all other Greek ports, imports greatly exceed exports. About one-quarter of the total imports are derived from the coasting trade and comprise products of Greece itself. Before the outbreak of war in 1939 Greek trade appeared to be gravitating more and more towards Central Europe, and that of Thessaloníki was no exception. Most of the foreign imports came from Germany, which country also had the leading share of the export trade. The table on p. 249 shows the total merchandise passing through the customs in 1937.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Live animals (number)	593,033	Alcoholic drinks	0 8
Foodstuffs	111 6	Agricultural products (mainly tobacco)	15 8
Sugar	18 6	Sugar	0 0
Timber and wood products	52 7	Timber and wood products	0 6
Minerals	204 2	Minerals	19·5
Metal products	56 0	Metal products	3 0
Chemicals	3 4	Chemicals	0 2
Paper	1 2	Paper	0·2
Textiles	6 0	Leather and skins	0 6
Miscellaneous	4 2	Miscellaneous	1·8
Total	457 9	Total	42 5

Source *Bulletin mensuel du commerce special de la Grèce avec les pays étrangers—1937—Décembre*, pp 26–8 (Athènes, 1938)

Wheat, wheat flour, coal, timber, cement, and sugar make up most of the weight of the imports. As an exporter of tobacco Thessaloníki is only rivalled by Kaválla, and of recent years its share in the tobacco trade has been increasing. Macedonian tobacco is exported to all parts of the world, but chiefly to Germany and the United States. Lead and zinc concentrates from mines in Jugoslavia are exported via Thessaloníki by the Trepča Mines Co., an Anglo-American firm. Most of the trade passes through the Greek Free Zone which normally deals with about 80% of the total imports and handles more consignments to and from Jugoslavia than the Jugoslav Free Zone itself. In 1938 the total shipping tonnage entering and clearing the port was 2.9 million tons (see table on p. 250). Thessaloníki is a regular port of call for British and American shipping lines trading with the Levant and has frequent services to other Greek ports. The figures for the passenger traffic indicate the importance of sea communications in the economy of Greece. In 1938 some 67,000 passengers used the port, of whom 63,000 were coming from or proceeding to other Greek ports.

Industries

Industrial development in Thessaloníki is of recent date. Many of the industries are directly connected with the agricultural products of Makedhonía, and there are large abattoirs with an associated refrigeration plant. The town ranks second to the Athens-Piraiévs district in the textile industry and possesses cotton-spinning and weaving factories, a woollen industry, carpet factories, knitwear centres and silk-weaving works. Minor establishments comprise

Thessaloniki—Shipping Traffic, 1938

Traffic Category	Entrances						Clearances					
	Laden				In ballast		Laden				In ballast	
	No. of vessels	Net tonnage	Cargo –tons	Passen-gers	No of vessels	Net tonnage	No. of vessels	Net tonnage	Cargo –tons	Passen-gers	No of vessels	Net tonnage
Steamers												
Foreign	184	284,450	252,705	580	56	107,679	179	327,085	168,572	1,323	207	360,329
Calling—Foreign	389	682,755	149,460	662	43	68,325	179	292,440	44,354	1,425	107	161,570
Coasting	530	272,743	122,982	27,070	12	7,867	458	256,570	54,710	36,070	82	22,951
Sailing Vessels												
Foreign	6	177	112	—	—	—	4	510	1,180	—	2	59
Calling—Foreign	—	—	—	—	3	441	—	—	—	—	3	92
Coasting	877	46,535	75,212	—	38	1,868	392	19,058	20,373	—	507	28,778

Source *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 162–5 (Athènes, 1939).

flour-mills, breweries, confectionery works, tobacco factories, soap works and a rubber factory concerned mainly with footwear. There are two engine repair sheds, but neither is able to effect major repairs.

Communications

It is primarily due to the lack of good communications that Thessaloníki does not enjoy the full benefits of its excellent geographical position. The presence of the Allied armies in this part of Greece from 1915–18 resulted in the construction of a system of narrow but good roads, so that Thessaloníki is better supplied with road connexions than most other parts of Greece. There are three main roads: north-west to Édhessa, Flórina and Bitolj (Monastir), from which branch roads run to Kozáni and Lárisa, north to the Axiós valley and Doïráni, and eastwards to Sérrai and Bulgaria. The road surfaces for the most part are unsuitable for heavy motor traffic and transport often depends on primitive means. Four railway lines also converge on Thessaloníki. The line up the Axiós valley to Skoplje provides a connexion with the railway system of Central Europe, and the line to Alexandroúpolis links up with the Turkish sections of the Orient Express route to İstanbul. There is also another line to Flórina and Bitolj. Rail connexion to Lárisa and Athens is provided by the line constructed during the 1914–18 war, which diverges southwards from Platí on the Thessaloníki-Flórina line. All these lines are single-tracked.

A relic of the war of 1914–18 that still survives is the narrow-gauge line to Stavrós on the east coast of the Khalkidhikí peninsula. These communications are inadequate if Thessaloníki is to become the main port for the south-eastern Balkans, but up to the present the governments of the various countries which might be involved have been more concerned with ports lying inside their own territories, and Thessaloníki is still mainly dependent for its trade on Makedhonía.

Pátrai (Patras)

38° 15′ N., 21° 44′ E. Population 73,840

Pátrai is the largest town of the Pelopónnisos and the fourth city of Greece, after Athens, Piraiévs and Thessaloníki. As a passenger port it is second only to Piraiévs, though Thessaloníki normally handles a greater tonnage of merchandise. The town is situated on

the south-eastern shores of the Gulf of Pátrai, which separates the Pelopónnisos from Aitolía and communicates eastwards with the Gulf of Kórinthos.

Approach and Access

The harbour may be approached from the west via the Gulf of Pátrai, which opens between Cape Pápas and Oxiá Island, or from the east via the Gulf of Kórinthos, which narrows to a width of one mile between Cape Andírrion on the north and Cape Ríon on the south. In these narrows there is a tidal current, the direction of which varies according to the changes in the level of the water in the Gulf of Kórinthos. At the western end of the Gulf of Pátrai winds frequently cause strong currents around Cape Pápas. There are no tides or currents to interfere with the working of the port, but any strong westerly winds interrupt the loading and discharging of cargo. At such times, owing to the poor holding ground in the harbour, vessels of over 2,000 tons have to anchor outside the breakwater.

Detailed Description (Fig. 43; Plates 56 and 57)

The harbour is protected by a detached breakwater about 2,800 ft. in length which runs from north-east to south-west and gives protection from most storms. Vessels too large to enter the harbour can be berthed outside, with sterns attached to one end or the other of the breakwater. Opposite the breakwater is the main quay, 2,350 ft. long and with dredged depths alongside varying from 23 to 26 ft. The longer south-western part of the quay is used by colliers and vessels of all sizes; the shorter north-eastern part is used only by small craft. The quay surface is rough, but a metre-gauge railway runs along the boulevard immediately behind the water-front. Two moles project at right angles from the main quay and together with the breakwater form a comparatively well-sheltered basin. The south-western, or Kalávrita, mole has a length of about 640 ft. and a width of 90 ft. At the shoreward end of the mole the north-east face turns east to cut off the corner of the basin, thus dividing the mole into two sections, 380 ft long in the west, and 360 ft. long in the east. Both sections are used by merchant vessels of all sizes, usually lying alongside in a depth of 26 ft. The south-west side of the mole is unfaced and unusable. The north-eastern or Áyios Nikólaos mole has a width of 60 ft. and provides 740 ft. of quay space on either side. Vessels drawing more than 22 ft. usually moor

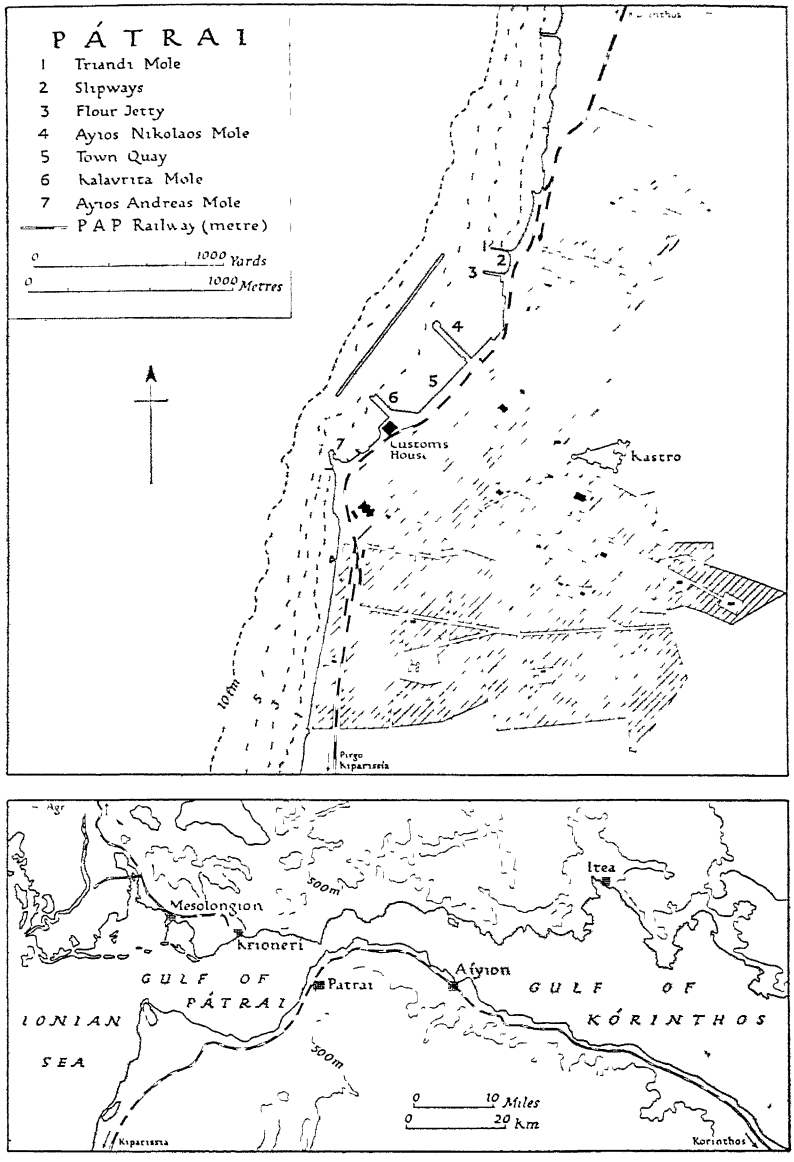


Fig 43 The port of Pátrai (Patras) and its location

stern-to at the north side, vessels drawing less can come alongside the southern face, but the roughness of the underwater portion of the quay makes this dangerous. Almost opposite the northern end of the breakwater, and marking the northern limit of the harbour, is a third mole, known as the Triándi mole. It is of rubble construction and has an approximate length of 400 ft.; the depth off the south-western side is 23 ft. This mole is being removed to make way for a grain-discharge quay, but the necessary installations have not yet been constructed; at present it is entirely unfaced and is not used by any types of shipping. A fourth mole, the Áyios Andréas, lies south-west of the Kalávrita mole, from which it is separated by a broken foreshore some 350 yards long. It is a spit of land about 150 ft. in length and is used by small craft and boats. On its southern side a narrow jetty which extends westwards for 100 ft. is also used by small vessels.

Apart from these major quays there are several jetties which increase the port facilities, but only one lies within the shelter of the breakwater. This is the Flour jetty, immediately south of Triándi mole, 370 ft. long with a width of 25 ft. It is used by medium-sized and small merchant ships. The other jetties have specialized functions and are only suitable for small vessels.

Port Facilities

In addition to a motor vessel and seven caiques used in the passenger service there were four tugs and about 130 lighters in serviceable condition before the Axis occupation of Greece. Three lighters, each with a capacity of 20 tons, have been converted for use as water tanks, and there are no watering facilities alongside. The harbour possesses one electric travelling crane with a lifting capacity of 35 tons, which traverses the southern portion of the main quay wall, and a floating sheer-legs which can lift 40 tons. The principal warehouses are immediately behind the main quay, between Triándi mole and Áyios Nikólaos mole in the north, and between Kalávrita mole and Áyios Andréas mole in the south. Ship repair and building facilities are limited to four or five slipways for small craft, lying between Triándi mole and the Flour jetty.

Coal stocks normally amounted to little more than 100 tons. There is no special bunker quay and what stocks there are lie at the southern end of the main quay. Ships anchored outside the harbour are supplied from lighters at a rate of from 5 to 10 tons per hour, but in exceptional cases they may be loaded direct from the north-east

side of Áyios Nikólaos mole. Fuel oil supplies which are stored on the beach were also very limited, the average stocks being 300–600 tons.

The Town

Pátrai stands on a fertile but narrow coastal plain of alluvium, and is partially encircled to the east and south by mountains which culminate in Mount Panakhaïkón, 6,322 ft. above sea-level. On a spur which approaches the sea behind the town, and dominating it, is the old Venetian and Turkish castle (Kástro), now used as a prison and barracks. The town itself, reconstructed by Capodistrias after its burning by the Turks in 1821, is laid out in a rectangular pattern with squares and arcades. There is a less regularly conceived and less closely built extension to the south-east: here many of the numerous refugees settled in and after 1923. Apart from the castle, there are few buildings of interest: the church of Áyios Andréas is modern, and the chief public buildings are grouped round the main square, named after King George I. There is a Roman Catholic and an English church, both dedicated to St Andrew (see below), and also a synagogue. There are two orphanages and a hospital, with departments for radiology and the treatment of phthisis.

Pátrai is the seat of the nomarchy of Akhaía, and of a bishop. It has superior administrative control of the gendarmerie of the Pelopónnisos, as well as the control of the gendarmerie of Akhaía and of its own *Astinomía*. Its courts try Appeal and First Instance cases.

The town is very fully lighted by electricity, but the ambitious scheme to use the river Glávkos as a source of hydro-electric power was unsuccessful; gas also is available, though dependent on the maintenance of sufficient coal supplies. Drinking water is brought in pipes from the north-west slope of Mount Panakhaïkón, and is freely supplemented from wells, since water is plentiful at a depth of 3–18 ft. below the surface of the town.

History

In classical Greek and Roman times Patras, capital of Achaea, had considerable economic importance: it was at the height of its fame and prosperity under Augustus, owing especially to its weaving industry. It was an early centre of Christianity, and St Andrew was said to have been martyred and buried there. It maintained a greater and more lasting prosperity than many towns more famous

in antiquity, and after the Slav invasions of the Balkans its population grew rapidly in the eighth and ninth centuries, and commerce flourished. The Turks and Venetians long disputed its possession, and it changed hands many times until, in 1821, under Archbishop Yermanós, it headed the revolt against the Turks and was destroyed. With its rebuilding and the growth of trade and population in the new kingdom of Greece, adequate harbour facilities became necessary, and the present harbour was built soon after 1880. For the needs of modern traffic, however, this is still insufficient, and new works have been started by the Harbour Board to increase the length of quays. Part of this constructional work is the making of a new quay face at the northern end of the main quay.

Trade

Pátrai is concerned much more with passenger traffic than with cargo. Its imports consist mainly of foodstuffs, and other bulky materials such as coal: its exports are almost entirely agricultural products of high value. The most important are currants.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Agricultural products	31 6	Agricultural products (mainly currants and sultanas)	43·2
Sugar and confectionery	4 6	Alcoholic drinks	3·6
Timber and wood products	16 6	Timber and wood products	0 2
Minerals (coal, coke, cement, etc)	11 5	Hides and leather	0·3
Chemicals	1·7	Chemicals	0 1
Metal products	6 9	Miscellaneous	0 4
Paper products	11·0		
Textiles	1 4		
Miscellaneous	0 8		
Total	86 1	Total	47 8

Source· *Bulletin du commerce, loc cit.*

Pátrai has a larger export trade in proportion to its volume of imports than all the other major ports of Greece. Germany, Italy and the United Kingdom supply the greater part of the imports, but the export trade is overwhelmingly with the United Kingdom Large quantities of currants and sultanas are regularly shipped to this country, especially for the Christmas market; Pátrai is the principal Greek port for the export of Corinth currants, although other small ports in the west and south of the Pelopónnisos also share the trade. Most of the wine exports of Greece also pass through

Pátrai, but the trade is only of small proportions. The passenger traffic is quite considerable: in 1938 a total of approximately 181,000 passengers used the port, but only 4,448 of these were from, or destined for, foreign countries (see table on p 257). Pátrai is the meeting-place of the coasting trade of both eastern and western Greece and consequently it has regular and numerous connexions with all other parts of the country. Frequent services, mostly provided by Italian lines, link it also with the ports of the Adriatic. The tonnage of Italian shipping is very great indeed and is roughly equal to one-half of the tonnage of Greek vessels using the port, though the latter are almost entirely small vessels engaged in the coasting trade. In the foreign trade Italian vessels account for 75 % of the total net tonnage of 1.2 million tons entering and clearing the port.

Industries

The industries of Pátrai are almost negligible, and their main concern is with the preparation of agricultural products. There is some wine pressing, and notably the production of vintage wines, of which the chief is the sweetish dessert-wine, Mavrodaphne: others are of the malmsey type, and that called Akhaía. The drying of grapes for currants is an important activity; this is done in the sun, with no need for artificial drying. Minor industrial plants include a textile mill, a flour-mill and a saw-mill, and there is paper-making, carpet-weaving, and brewing.

Communications

The inadequacy of facilities for the clearance of merchandise by road and rail is the most serious of the factors that limit the amount of cargo that can be passed through the port. Road communications round Pátrai are far from good. There is a two-way road to Kórinthos; a second road leads south to Olimbía, but it is frequently impassable. Rail communication with Kórinthos and Athens is provided by the metre-gauge P A P. railway. The line enters the town from the east, passes along the water-front and continues round the coast of the Gulf of Pátrai to reach Kiparissía and Kalámai. The line is only of single track and consequently its freight capacity is small. Passengers arriving in the country from the west can use the line as a quicker means of reaching the capital than travelling to Piraiévs by sea.

Pátrai—Shipping Traffic, 1938

Traffic Category	Entrances						Clearances					
	Laden				In ballast		Laden				In ballast	
	No. of vessels	Net tonnage	Cargo -tons	Passen-gers	No of vessels	Net tonnage	No of vessels	Net tonnage	Cargo -tons	Passen-gers	No. of vessels	Net tonnage
Steamers												
Foreign	164	551,313	52,380	1,887	23	60,952	152	576,602	30,775	2,439	12	15,490
Calling—Foreign	99	119,875	19,641	46	175	218,472	157	173,068	33,443	76	142	186,908
Coasting	2,285	855,038	28,563	91,353	8	1,260	2,226	846,396	13,985	85,585	65	8,444
Sailing Vessels												
Foreign	55	5,234	10,360	—	1	144	—	—	—	—	28	2,580
Calling—Foreign	12	921	1,225	—	1	70	1	179	102	—	38	3,404
Coasting	559	27,597	36,286	91	89	4,010	261	11,992	9,496	—	393	20,146

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 222–5 (Athènes, 1939).

VÓLOS

39° 23′ N., 22° 25′ E. Population 51,000

Vólos lies at the head of a small bay on the northern side of the Gulf of Pagasaí. It is the fourth port of Greece and the outlet for the rich plains of Thessalía.

Approach and Access

The Gulf of Pagasaí is entered through Vólos channel, which has a width of some 3 miles between Cape Stavrós to the south and Cape Kavoúlia on the Tríkeri peninsula to the north. There are no dangers to navigation within the gulf and the port is well sheltered, although strong north-west and south-west winds may make mooring difficult.

Detailed Description (Fig. 44; Plate 58)

The natural harbour is protected on its eastern and south-eastern sides by a breakwater, running south-west for 490 ft. and then west-south-west for a further 2,600 ft., while on the west it is partially protected by the railway pier and its narrow extension. A sea wall along the town water-front forms the north-eastern side of the harbour, and from it there extends the 'town pier', a concrete mole structure some 820 ft. long and 360 ft. wide. A small basin, dredged to 12 ft., has been constructed in the northern section of the harbour for the use of lighters and fishing boats. Its western side is formed by the Customs House Quay, the south-western by a stone jetty some 330 ft. long. About 1,000 yards to the south-east of the harbour, specialized loading and discharging facilities are provided by two piers, one of which serves an oil depôt and the other, on which there are some cranes, a cement factory. They are just over 200 ft. long and have charted depths of from 0 to 8 ft. alongside. There are also two short piers to the south-west of the harbour.

The main entrance to the harbour is 300 yards wide and has a depth of 32 ft., but a very narrow way some 6–8 ft deep has been left between the breakwater and the sea wall for the use of small boats. In 1938, the greater part of the harbour was dredged to 29 ft. and depths alongside the quays were also increased. The western pier, which carries a railway for part of its length, has a depth of 23 ft. at its head and some 900 ft. berthing space with a depth of over 14 ft. The town pier has 28 ft. of water at its seaward end and

depths of 21–28 ft. along both its sides. Altogether, three vessels of 5,000 tons can be unloaded simultaneously at these two piers, and vessels can also moor stern-to at the breakwater.

Port Facilities

Apart from two tugs and a few passenger motor-boats there are normally some twenty-five lighters and about twelve trawlers in the harbour. One of the lighters is fitted with a small pair of sheer-legs. There are also three small hand-cranes on the Customs House Quay with capacities of 1, 3, and 5 tons respectively. Minor repairs to machinery can be undertaken at two small foundries close to the railway station, and to the west of the harbour there is a small building yard and slipway for sailing vessels up to 50 tons. The coaling pier, alongside which there is a depth of 19 ft., is equipped with a travelling crane of 1 ton capacity. Normally coal stocks amount to about 10,000 tons. Shell Oil Company owns installations to the east of the harbour which include three tanks for gas oil with a total capacity of 82,800 cu. ft., and two fuel oil tanks with a capacity of 115,000 cu. ft. The fuel oil is pumped ashore by pipe line.

The Town

Vólos consists of the pleasant new town, regularly laid out along the shores of the bay, and the old, or upper, town (Áno Vólos), which is a scattered village built on the cliffs to the north-east of the town. Vólos is not on the site of any ancient town, but lies near the ruins of Demetrias, Iolcus (whence the Argonauts sailed), and Pagasae. Its growth since 1881 has been rapid, as the depôt for the increasing exports of Thessalía. Moreover, refugees from Turkey greatly added to its population in 1923 and the following years. There is a ruined Byzantine church: that of Áyios Theódhoros is modern. The civil hospital is on the road to Miléai, and close to it is a museum in the charge of the *Epimelitís* of Antiquities for Thessalía. Vólos is the seat of an eparchy and a demarchy, and of the Archbishop of Dhimitriás. It controls the gendarmerie of Magnisía, and has a Court of the First Instance and a Court of a Justice of the Peace, as well as a Police Court and legal offices. There are consular offices, a garrison with barracks, and a military hospital on the front.

At Áno Vólos, on the slopes of Mount Pílion, are two sanatoria. In the town, electric lighting has replaced gas. Water is derived from artesian wells, but for drinking purposes is also brought from Agría in jars.

Trade

Vólos handles a variety of products and has no particular specialization.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs (mainly cereals)	41 3	Agricultural products (especially tobacco)	4 6
Sugar	5 6	Olives and olive-oil	5·6
Timber and wood products	10 0	Timber and wood products	0 5
Minerals (mainly coal, coke, cement)	46 6	Minerals	17 3
Metal products	6 2	Metal products	3 1
Chemicals	1 0	Skins and leather	0 3
Textiles	0·8	Miscellaneous	0 1
Miscellaneous	0 7		
Total	112 2	Total	31 5

Source · *Bulletin du commerce, loc cit*

The list of imports is much the same as for other ports of Greece: the exports are composed of the tobacco, vegetables, oils and wines of Thessalía, together with a certain amount of chromite that is mined in the vicinity (see p. 117). The passenger traffic in both directions is about 25,000 persons (see table on p. 261). In 1938 the total tonnage entering and clearing the port was about 1.6 million tons, the foreign trade of the port is small, and is mainly concerned with the chromite export.

Industries

There is a certain amount of industrial activity in the town, mainly of small establishments working up agricultural products. Tobacco and cigarette manufacturing, fruit preserving, leather working and tanning, flour milling, cement and brick manufacturing are the main industrial occupations. A fruit-refrigerating plant was established in 1923

Communications

There are two roads, one to Lamía and one to Lárisa, both of which are in bad condition and impassable during wet weather. The port is the eastern terminus of the metre-gauge Thessalía railway which runs inland to Velestínon and there forks for Lárisa and Kalabáka. A narrow-gauge line (60 cm.) runs eastward from Vólos to Miléai on the lower slopes of Mount Pílion. All these lines are single track and of low freight-carrying capacity. Telegraphic communications are available.

Vólos—Shipping Traffic, 1938

Traffic Category	Entrances						Clearances					
	Laden				In ballast		Laden				In ballast	
	No. of vessels	Net tonnage	Cargo -tons	Passen-gers	No. of vessels	Net tonnage	No. of vessels	Net tonnage	Cargo -tons	Passen-gers	No. of vessels	Net tonnage
Steamers												
Foreign	22	25,143	23,957	—	14	20,496	13	14,664	4,348	1	14	17,820
Calling—Foreign	180	304,896	82,957	463	33	45,377	130	222,809	19,824	463	89	137,735
Coasting	930	421,438	19,888	24,814	8	3,391	935	422,607	28,524	28,524	5	3,224
Sailing Vessels												
Foreign	1	28	60	—	—	—	—	—	—	—	—	—
Coasting	350	17,512	24,332	—	124	6,039	275	13,327	18,713	—	209	10,694

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 138–41 (Athènes, 1939)

KALÁMAI (CALAMATA)

37° 02′ N., 22° 07′ E. Population 33,230

Kalámai stands in the north-east corner of the Gulf of Kalámai which opens between Cape Akrítas and Cape Taínaron (Matapan) in the south of the Pelopónnisos. It is the second port of the Pelopónnisos, being surpassed only by Pátrai; and judged by the amount of cargo handled it is the sixth of all Greek ports.

Approach and Access

There are no difficulties in approaching the harbour, and temporary anchorage can be found outside the breakwater. The harbour itself is well protected and it is only when winds are very strong from the east-north-east that loading and discharging operations may be difficult. Constructional works to increase the area of the harbour and to give it greater protection from the east were started before the outbreak of war in 1940. The improvements have not been completed and details of depths and quay lengths are not known accurately. The entrance to the recently extended harbour faces south-east and lies between a western breakwater-mole and an eastern mole. The width between the two structures is 650 ft. and depths across the entrance are said to be about 40 ft.

Detailed Description (Fig. 45; Plate 59)

The western breakwater-mole runs south for a short distance, then continues south-east for about 1,650 ft. and finally turns eastwards for a further 1,470 ft. The inner side is faced, and portions of it can be used as direct discharging berths for large steamers. The last 820 ft. is faced on both sides. A road suitable for motor traffic runs most of the way along the structure. The eastern mole, 1,300 ft. long, runs south at right angles to the shore-line, and then turns south-west towards the end of the breakwater. It is faced on the inner side and has charted depths of 36 ft. The harbour that lies between these two structures is divided into two parts by a central mole that extends southwards for 900 ft. The mole is faced on its western side, where there is an alongside depth of 11 ft. The town quay forms the northern side of the western harbour and has a length of 1,340 ft. with depths of from 10 to 15 ft. Vessels using the quay invariably lie stern-to. In the extreme north-western corner is a

small boat harbour with quays 450 ft. long on its northern side and 480 ft. on the eastern. The western side continues the line of the breakwater and provides 1,170 ft. of quay space with an alongside depth of at least 15 ft. Depths in the central part of this small harbour are about 20 ft., possibly decreasing northwards to 13 ft.

Port Facilities

The principal warehouses and the customs house lie immediately north of the north-western basin, but there are probably other warehouses in the town itself. Cargo is normally handled by ship's equipment and before the outbreak of war much of the discharging was into lighters. The western quay, on the inner side of the breakwater, has a crane of 6 tons lifting capacity, and there are three others of smaller capacity. There are no repair facilities within the harbour and stocks of coal and fuel oils are very small.

The Town

Kalámai lies a mile inland from the port (Skála), on the left bank of the river Nédhon, with the suburb of Kalívia on the right bank. The town lies among groves of oranges and lemons: it is traversed by a broad main road, and there are bridges, including one of iron, across the river. On the ancient acropolis to the north-east is a Frankish castle. The church of Áyioi Apóstoloi is Byzantine with seventeenth-century additions in the Italian style. Kalámai is a demarchy, the centre of the nomarchy of Messinía and the seat of an archbishop. The town has electric lighting generated by Diesel plants.

History

Kalámai takes its name from the ancient village of Calamae at the foot of Mount Taÿetos, although it stands on the site of the Homeric town of Pharae. In 1205 the town fell to Geoffrey de Villehardouin, and it was Geoffrey who built the strong castle that later passed into Venetian and then Turkish possession. Kalámai took part in the insurrection of the Maniates in 1770 and was one of the first places to fall to the Greek insurgents in the War of Independence. For its part in this rising the town was destroyed by Ibrahim Pasha in 1825. The port was built by a French company in 1889 and was adequate for the volume of traffic that passed through it until late in the 1930's.

Trade

The agricultural products of the plain of Messinía, such as figs, currants, oranges and wine, make up over 95 % of the total exports. Imports are very much the same as those of other Greek ports and are largely products of Greece itself carried by coasting steamers and caiques.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Agricultural products and foodstuffs	52 9	Figs, currants, etc.	26 8
Sugar	1·1	Alcoholic drinks	5·5
Timber and wood products	3·8	Minerals	1 0
Minerals	7·1	Miscellaneous	0 4
Metals	0 4		
Chemicals	1 8		
Miscellaneous	0 2		
Total	67 3	Total	33 7

Source *Bulletin du commerce, loc cit.*

The total tonnage of shipping entered and cleared in 1938 was 764,000 tons. Most of this tonnage was Greek-owned, engaged in the coasting or calling-foreign trade, but a very large number of vessels flying the Italian flag also called at the port. The passenger traffic is quite small, and is usually not more than 2,000 passengers per year in each direction (see table on p. 265).

Industries

There are a number of small agricultural industries closely connected with the produce from the plains of Messinía. These include several groups of factories engaged in cotton-ginning and spinning, silk-spinning, olive-oil refining and currant production. A large flour-milling works lies near the north-western basin Just to the west of the harbour there is a tannery and an abattoir. A manganese mine in the vicinity is the source of the occasional shipments of ore from the port (see p 115)

Communications

Road and rail communications are relatively good. A road runs northwards to Trípolis and another west to Pílos on Navarínon Bay. The port is also the terminus of the P.A.P. railway from the junction of Zevgolatió, some 20 miles to the north. From here two routes

Kalámai—Shipping Traffic, 1938

Traffic Category	Entrances						Clearances					
	Laden				In ballast		Laden				In ballast	
	No of vessels	Net tonnage	Cargo –tons	Passen-gers	No of vessels	Net tonnage	No. of vessels	Net tonnage	Cargo –tons	Passen-gers	No of vessels	Net tonnage
Steamers												
Foreign	27	35,201	18,221	—	37	53,308	92	116,755	19,618	—	12	16,557
Calling—Foreign	73	113,328	48,384	—	103	117,940	97	124,529	22,030	—	45	66,995
Coasting	97	37,953	15,255	1,377	6	952	74	26,009	2,253	1,929	23	7,837
Sailing Vessels												
Foreign	1	116	234	—	9	1,717	16	3,819	4,069	—	—	—
Calling—Foreign	1	190	115	—	7	2,088	1	175	150	—	1	190
Coasting	241	13,889	19,770	622	94	5,432	233	13,284	22,471	717	102	5,964

Source: *Statistique du mouvement de la navigation pendant l'année* 1938, pp. 190–3 (Athènes, 1939)

are available, one to Megalópolis and Trípolis and the other to the west coast of the Pelopónnisos. An electric tramway runs to the port. Kalámai has a weekly steamer service with Piraiévs and ports on the Adriatic. It has also telegraph and cable connexions with Athens and is linked by telephone with the larger towns of the Pelopónnisos.

Kaválla

40° 56′ N., 24° 25′ E. Population 55,280

Kaválla is the chief port of Dhitikí Thráki and the sixth port of mainland Greece, judged on the basis of net tonnage entered and cleared.

Approach and Access

The town is on the north-eastern shores of the Gulf of Kaválla, which is partly sheltered by the mountainous island of Thásos. It lies at the head of a small bay where, with the exception of a detached 3 fathoms patch, the depths are regular and gradually decrease towards the shore. Until very recently the port was little more than an open roadstead, and in strong winds it was unusable, vessels having to seek shelter at Thásos some 14 miles to the south, or at Elévthera cove to the west.

Detailed Description (Fig. 46; Plate 60)

About 1929 improvements in the harbour facilities were authorized and work has been going on intermittently since that date. It is now largely completed. The harbour is bounded on the south by a breakwater-mole, some 1,800 ft. in length, constructed of pre-cast concrete blocks on a rubble base It has a width of 23 ft., an alongside depth of 32 feet, and is fitted with mooring bollards. On the west of the harbour a mole 165 ft. long and 100 ft. wide runs south towards the head of the breakwater-mole As yet, work on this structure is not finished. In the north-east corner of the harbour is a small boat harbour which is mainly used by lighters but can also be entered by small steamers engaged in traffic with the neighbouring Greek islands. The quays around the new harbour are almost completed and the space between them and the old shore has been filled in to provide a wide area for open storage and warehouses. Details of the various quays are given in the table on p. 267.

Details of Quays in Kaválla Harbour

Name of Quay	Length (ft)	Depth alongside (ft.)	Height above M.W.L.O S. (ft.)	Remarks
Breakwater-mole	1,800	32	8½	Sea wall on outer side; faced inner side; general cargo
East Quay	1,246	33	6½	Masonry blocks; two hand cranes; one electric travelling crane
Boat Harbour Quays	1,650 (total)	10–13	5	Lighters, general cargo
North Quay	850	26	6½	General cargo
West Mole	165 × 100	32	8	Work on extension in progress

Port Facilities

Before 1940 it was customary for ships to unload into lighters, of which there were about fifty of 20–25 tons capacity, but during strong winds all discharging operations stopped. Lifting appliances consist solely of two small hand cranes, an electrically driven travelling crane of 3½ tons capacity and two sheer-legs on pontoons. There is a shortage of warehouse space, and tobacco has often to be stored on the quay while awaiting the arrival of a ship. Two small shipyards are capable of handling small craft.

The Town

From the sea Kaválla presents a highly picturesque appearance. It stands on a peninsula which rises steeply to a lofty summit surrounded by a battlemented castle, and, at the northern end, where the peninsula joins the mainland, an intervening depression is spanned by a remarkable aqueduct of Byzantine origin. The walls of the town follow the line of the sea cliffs and enclose the old and crowded Turkish quarter, with its narrow twisting streets; to the west are the better-built stone houses of the modern town. The water-front is lined with imposing buildings, some of which are five-storey structures. Kaválla is a nomarchy and demarchy, the seat of a bishop, and the headquarters of an Army Corps. Its electric light works are publicly owned, and its water is supplied by a company from six artesian wells.

History

Kaválla is believed to occupy the site of the ancient Neapolis, the port of Philippi: its modern name is said to be derived from its

importance as a posting stage (late Latin *caballus*, 'horse'). It was a Turkish possession until the outbreak of the First Balkan war in 1912, after which it changed hands several times, being alternately Greek and Bulgarian. In 1918 it was handed back to Greece and remained in Greek possession until the German attack in 1941, when it was once more occupied by Bulgarians

Trade

The trade of Kaválla is overwhelmingly concerned with the export of Macedonian tobacco, a trade which it shares with Thessaloníki. There are no other industries. Vessels of many flags put into the harbour during the tobacco season, including ships from the United States, Germany, the Netherlands, the United Kingdom and other countries of northern Europe. Apart from the tobacco export the commerce of Kaválla is mainly concerned with the coastal trade, and the importation of coal, wheat, flour and other necessities. About 70% of the imports come from Greece itself, which takes only 50% of the exports The town feels the competition of Thessaloníki keenly, which has better facilities for the handling of such a valuable cargo as tobacco. The passenger traffic of the port is quite small, consisting of some 8,000 passengers a year in either direction. The total tonnage of shipping entered and cleared in 1938 was 560,000 tons.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs and agricultural produce	2 8	Tobacco	13 2
Sugar	3 1		
Timber and wood products	13 4		
Minerals	2 4		
Miscellaneous	0·5		
Total	22 2	Total	13·2

Source *Bulletin du commerce, loc cit*

Communications

Communications in the district around Kaválla are poor, and merchandise reaches the port by very primitive means. The road to Dráma, 23 miles away, is the only road in the district which is reported to be in good condition, the roads to Stavrós and Thessaloníki and to Alexandroúpolis being very unsatisfactory. The nearest railway is the Thessaloníki-Alexandroúpolis line, which was

deliberately built to avoid the port for strategic reasons. A steamer service is normally available to Thessaloníki and Piraiévs. The town has a telegraph and telephone service.

Alexandroúpolis (Dedéagach)

40° 50′ N., 25° 52′ E. Population 15,470

Alexandroúpolis, formerly Dedéagach, is the seventh port of mainland Greece by tonnage entered and cleared, but its economic importance as yet is not very great.

Approach and Access

The port lies on the western fringe of the uninhabited and marshy delta of the Évros on the north-western shores of the Gulf of Enez. There are no defined channels to the harbour and no hindrances to navigation, except for a coastal bank some 400 yds. broad where the depths are less than 3 fathoms. The gulf is open to the south and the port cannot be used when strong south winds are blowing. Under such conditions vessels are obliged to put to sea, and usually find shelter off the island of Samothráki.

Detailed Description (Fig. 47; Plates 61 and 62)

The port is being developed to allow steamships to use it, but as yet it remains little more than an open roadstead. The harbour is small and is suitable only for caiques and other small craft. It is formed by the main quay along the town front and, on the east, by a projecting mole, 160 ft. long and 30 ft. wide. The western side is protected by a breakwater-mole, extending 280 ft. from the shore, and then turning at right angles to form a southern arm, 400 ft. long. Work on the extension of this breakwater was started in 1933, but it still remains under construction. Eventually it will provide 1,300 ft of quay space on its eastern side, with a depth alongside of from 10 to 25 ft The harbour has a depth at entrance of 9–10 ft., decreasing to 6 ft. along the town quay. To the east three short piers, of light construction, provide further facilities for small craft.

Port Facilities

One hand crane of 2½ tons capacity is located at the western end of the town quay; there is also a floating crane of 5 tons capacity and a floating sheer-legs of 100 tons. Ample storage space is provided

by three warehouses and three transit sheds near the water-front. There are normally some forty to fifty lighters with a total capacity of 1,200 tons, and a shipyard can build small wooden ships of the caique or felucca type.

The Town

Alexandroúpolis derived its Turkish name, Dedéagach, from the establishment here in the fifteenth century of a community of

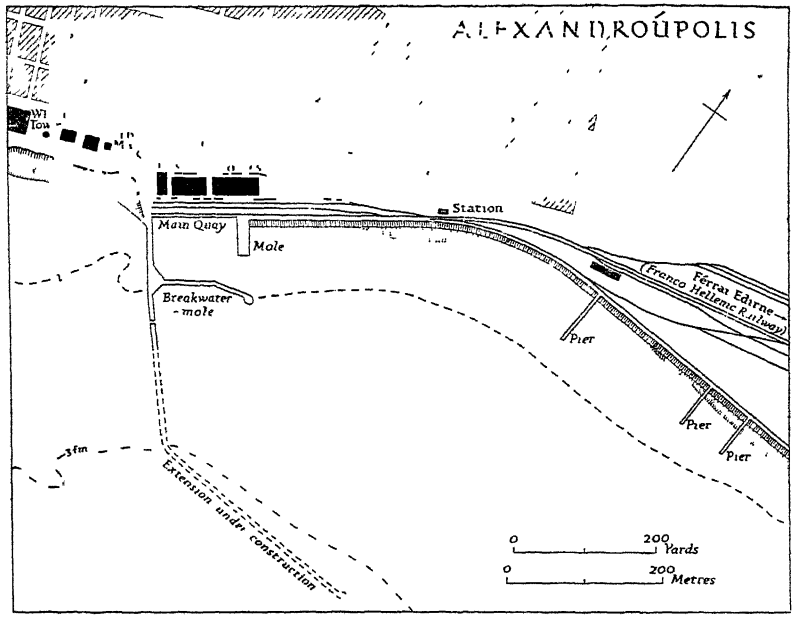


Fig. 47. The port of Alexandroúpolis (Dedéagach)

dervishes of the Dédé sect. The place remained a fishing village until 1871, when settlers were attracted by the presence of the Valona oak forest in the neighbourhood; its importance rapidly increased in 1896 with the opening of the Thessaloníki-İstanbul railway, which diverted much trade from Enez to Dedéagach. This prosperity dwindled later, but the port retained a considerable volume of local traffic, and is strategically very well placed. After the Balkan Wars, by the Treaty of Bucharest (August 1913), Dedéagach passed into Bulgarian hands, but after the war of 1914–18 it was assigned to Greece, and by the Treaty of Lausanne (1922) it

became the frontier-town of Greece and Turkey. Nevertheless, Bulgarian interest in Alexandroúpolis was implicitly recognized by the Allied Powers at the Treaty of Neuilly, November 1919. Article 48 states 'The principal Allied and Associated Powers undertake to ensure the economic outlets of Bulgaria to the Aegean Sea. The conditions of this guarantee will be formed at a later date'. Nothing was done, however, to extend harbour facilities, and Bulgaria turned her attention instead to the development of her Black Sea ports.

The town is modern and well planned, with broad streets, but the water supply is unreliable and malaria is prevalent in summer. It administers a nomarchy and has a bishop: there is a Court of the First Instance (with appeal to Komitiní) and a Court of a Justice of the Peace. The hospital has only 24 beds.

Trade

The trade of Alexandroúpolis is small and the total amount of cargo handled in 1938 was barely more than 60,000 tons. Most of the trade of the port is coastwise, accounting for 80% of the total merchandise Exports direct to foreign countries were only 1,500 tons, of which by far the greatest item was tobacco. Imports from abroad were about 14,000 tons, which comprised in almost equal proportions by value, foodstuffs, coal, sugar, and timber and wood products. It is interesting that the tobacco export is generally greater in value than all imports from abroad. The shipping entering and clearing the port in 1938 totalled some 300,000 tons, and the passenger traffic is normally about 3,000 passengers in both directions.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs	1 7	Tobacco	0 9
Minerals	5 4	Minerals	0 3
Sugar	1 7	Miscellaneous	0 3
Timber and wood products	5 2		
Miscellaneous	0 3		
Total	14 3	Total	1 5

Source: *Bulletin du commerce, loc cit.*

Communications

Alexandroúpolis is connected to Kaválla and Thessaloníki by two roads, one following the coast and the other via Dráma and Sérrai.

These roads are in fair condition, but the road east to Turkey is only passable in the dry season. The town is the terminus of a railway line from Thessaloníki which forms part of the Hellenic State Railway system, and also of the Franco-Hellenic Company's line which connects Alexandroúpolis with Istanbul. The two lines are connected by a loop line to permit the working of through traffic. Both are single-tracked and of standard gauge.

KHALKÍS (CHALCIS)

38° 28′ N., 23° 36′ E. Population 21,000

Khalkís is not listed among the principal ports of Greece on the basis of total movement of shipping, but it ranks eleventh in the international trade of the country. The town lies on the eastern shores of the extremely narrow strait, known as the North Harbour of Khalkís, that separates the island of Évvoia from the mainland.

Approach and Access

The port is easily approached from the north through the comparatively wide Gulf of Évvoia, but the passage from the south is narrow and tortuous and not suitable for vessels of over 24 ft. draught. In this southern approach the first navigational difficulty is encountered in the narrow Búrji Channel, where the effective width is lessened from 600 yards to just over 400 yards by the existence of shallow banks on either side. The tidal stream rarely exceeds more than two knots, but winds are usually strong and variable. North of the channel is the wide outer harbour of Khalkís; extensive shallows off either shore restrict anchorage to the central part, where there are depths of 20–30 ft. Finally the Stenó Pass, with a navigable channel of only 100 yards, leads into the Khaklís Harbour.

Detailed Description (Fig. 48; Plate 63)

There are two harbours, the northern and the southern, connected by a very narrow channel only 129 ft. wide at its southern end. Only the South Harbour (Nótios Limín) is commercially important. It consists of a naturally circular basin, just over one mile in diameter. There is a general depth of from 30 to 36 ft. and good anchorage in a mud bottom can be found in the middle of the harbour. The sides of the basin are fringed by a narrow bank of shallow depth.

The North Harbour (Vórios Limín) is used only by fishing boats and small craft. It extends north-north-east for almost a mile, widening from 129 ft. in the south to over 2,000 ft. in the north. Both sides of the harbour are bordered by shallow banks, leaving a narrow channel between, with a general depth of from 23 to 27 ft. The channel between the North and South Harbours is only some 21 ft. deep and is spanned by a swing-bridge which opens northwards to allow ships to pass, provided they are going with the tidal stream. The spring tidal range is greater and the mean high water interval is longer in the North Harbour than in the South. As a result strong tidal streams are caused, which may run through the narrows at some six or seven knots.

The South Harbour has two main quays: the one on the mainland to the west of the Narrows is some 130 ft. long and is served by a railway; the other is about 500 ft. long and 130 ft. wide and can only be approached at the turn of the tide. The eastern side of the North Harbour consists of a sea wall which extends the full length of the town water-front. At intervals landing steps lead down to the water. A jetty is being built on the west side of the harbour to deal with ships of up to 5,000 tons. In addition to these quays there are a number of small piers and jetties used for the discharge of coal and cement.

Port Facilities

The normal harbour craft consist only of 2 tugs and 16 lighters Water is available, but vessels lying at anchor have to use their own facilities to obtain it. There is one crane with a lifting capacity of 10 tons. South of Vourkári Bay, a very shallow inlet on the east of the South Harbour, there is a small bight in which there is a boat-building yard, with a repair slip and a pier for the use of small craft.

The Town

The ramparts of the old Turkish town have been recently demolished and the fosse filled in, but testimony of the Venetian and Turkish control still remains in many of the buildings. Adjoining the town is the modern suburb with its public buildings, factories and the large square that extends to the shores of the Áyios Mínas Bay. Some of the 5,000 refugees who settled at Khalkís after 1923 occupy a new village called Vósporos (formerly Karábaba) on the mainland opposite

Khalkís is the seat of a nomarchy (Évvoia), an eparchy and a demarchy, and of a bishop. It is the headquarters of gendarmerie for Évvoia, and possesses a military and a civil hospital. There is a Court of the First Instance and a Criminal Court. The town is supplied with electricity from a local 550 h.p. Diesel-electric plant; water supplies are abundant.

History

The origin of Chalcis is doubtful, but it was certainly occupied in the Bronze Age. Its strategic position on the trade route from Attica to the rich plains of Thessaly, Macedonia and Thrace made it a flourishing seat of commerce in early times, and also a great colonising centre. It was subject to Athens in the fifth and fourth centuries B.C., and was used in 192 B.C. by Antiochus III and again in 88 B.C. by Mithridates VI as a base for the invasion of Greece. In the Middle Ages, the town was known as Egripo and was again important commercially. In 1210 it was occupied by the Venetians and held until the terrible massacre of 1470, when it fell to the Turks. By the Protocol of London, 1830, the island of Évvoia was transferred to the new kingdom of Greece.

Trade and Industries

Although Khalkís is to-day one of the less important of the principal Greek ports, its international trade is comparatively large. Imports of coal far surpass those of any other commodity, some 15,000–20,000 tons normally being destined for the railway that serves the town and much of the remainder for the large cement works. The export of mineral ores, consisting mostly of magnesite, is only second to that from Lávrion. Other exports are chiefly made up of cement, timber, wines and olives. Industrial development is small and is primarily concerned with cement making, distilling and pottery.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs	7·8	Timber and wood products	2·9
Sugar	0·8	Minerals (magnesite, cement, etc.)	42·3
Timber and wood products	1·9	Miscellaneous	0·3
Minerals (chiefly coal)	46·3		
Metals	1·7		
Chemicals	0·2		
Total	58·7	Total	45·5

Source: *Bulletin du commerce, loc. cit.*

Communications

By Greek standards communications are good. There is a road to Thívai which has a metalled surface in places, though it would not stand much heavy traffic. A standard-gauge railway connects the mainland opposite Khalkís with Oinóï on the Athens-Lárisa-Thessaloníki railway line. Coastwise steamships make daily trips to Piraiévs and Vólos, and the town has telegraphic communications with all parts of the world.

Lávrion (Laurium)

37° 44′ N., 24° 04′ E. Population 8,430

Lávrion is a small port on the south-east coast of the peninsula of Attikí, some 30 miles from Athens. It is the principal port in Greece for the shipment of mineral ores, and is entirely concerned with that industry.

Approach and Access

The port lies at the head of Lávrion (Ergastíria) Bay and is open to the east. To the north and north-east some protection is given by a peninsula with isolated hills rising about 100 ft. above sea level; to the south and south-east, hilly country again comes close to the sea. Off the southern shore of the bay, a shoal with a depth of 9 ft. over it prevents the approach of vessels to within 300–400 yards of the coast. Elsewhere depths vary from 18 to 50 ft., and vessels of up to 30 ft. draught can find indifferent anchorage in a mud bottom.

Detailed Description (Plates 64 and 65)

The port possesses a quay and two jetties with a third under construction. The first jetty belongs to the *Compagnie Française des Mines de Lavrion* and has a depth of 12 ft. at its end; it is designed to load ore and has two small steam cranes of 2½ tons capacity. The other jetty, now disused, has a depth of 16 ft. at its extremity. The jetty under construction measures some 200 ft. by 120 ft. and will have a depth of 15 ft. all round. It is finished to just below sea level. Alongside the quay there is a depth of from 15 ft. to 20 ft There are no tugs or lighters at the port, but there are a number of small fishing craft and other vessels. Small repairs can be carried out.

The Town

The town of Lávrion is based on a revival of the ore-mining and smelting industry and is entirely modern, consisting of workmen's houses laid out in regular lines and on a uniform pattern around the large smelting works. The population is Greek, except for a few French, German, Italian and English officials employed at the mines. Water supplies are ample, but reported to be brackish; electricity is supplied from Athens.

History

The occurrence of silver lead in the crystalline schists of this region was known from very early times, but it was not until the fifth century B.C., with the discovery of the rich Maroneia vein, that the ores were worked to any great extent. Slave labour was used and the extraction of the silver contributed greatly to the prosperity of Athens. Towards the end of the same century, however, the output fell, and the early importance of the mines as a source of silver has never been recovered. The modern workings are principally concerned with the production of lead, zinc and manganese. In 1873 a Marseilles company purchased the right to exploit most of the region and to-day the mines are mainly worked by a French company with furnaces at Lávrion and Kamáriza and a Greek company with centres at Lávrion and Dhaskalió (see pp. 117–18).

Trade and Industry

Lávrion and Katákolon are probably the only ports of Greece where exports exceed imports. This is because both are specialized; Lávrion's commerce is entirely concerned with the export of mineral ores and metals and the import of coal for use in the mines and refineries in the vicinity of the town.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Minerals (coal, etc)	8 8	Minerals (galena ores)	32·5
Metals	0 2	Metals (zinc and manganese)	2 5
Chemicals	0 2		
Total	9 2	Total	35 0

Source *Bulletin du commerce, loc. cit.*

The centre of the mining district is the village of Kamáriza, which is connected to Lávrion by a light railway. Zinc and manganese

are the metals produced in the greatest quantities; silver and lead being largely by-products from the galena ores. Some refining and smelting is carried out locally and there are a number of furnaces at the head of the bay (Plates 36 and 37).

Communications

There is good road communication with Athens, but other roads in the district are bad and frequently impassable. The capital can also be reached by means of the metre-gauge railway, which, though it is not actually part of the P.A.P. line, is connected to it.

KATÁKOLON

37° 38′ N., 21° 19′ E. Population c. 1,000

Katákolon is a small port on the west coast of the Pelopónnisos that only operates during part of the year for vessels of limited size. It is overwhelmingly concerned with the export of wines, currants and raisins produced in the fertile plains of Ilía.

Approach and Access

The port lies on the western side of a semicircular bay to the east of the Katákolon peninsula, a low tongue of land projecting two miles southwards. Both coasts of the peninsula are bordered by rocky shoals, and a sandy spit with a depth of 12 ft. over it extends almost half a mile from the southern point of the cape. The bay is quite sheltered from the west, but is exposed to southerly winds, which send in a heavy sea. Anchorage may be found all over the bay and the water shoals gradually towards the sandy beach at the head.

Detailed Description (Fig. 49; Plate 66)

The harbour is entirely artificial, and its depth of from 16 to 20 ft. is maintained by constant dredging. Excellent shelter from southerly winds is provided by a breakwater-mole which extends eastwards from the coast for 1,500 ft. and then north-eastwards for a further 850 ft. It has a width of 40 ft. and stands about 20 ft. above water level. Along the faced inner side there are potential berths for medium-sized vessels. The northern side of the harbour is protected by a breakwater 1,100 ft. in length, neither side of which is faced.

The quays that form the water-front between the two breakwaters (see following table) are only suitable for small craft, and owing to silting in this part of the harbour must be approached carefully.

Details of Quays in Katákolon Harbour

Name of Quay	Length (ft.)	Depth alongside (ft)	Remarks
Southern Quay	420	?	Irregular in outline; used only by small craft; concrete blocks faced with masonry
Central Mole	South 190 Head 320 North 160	8–16 16 16	Facilities for motor transport; used by caiques handling general cargo, and by passengers, two 2-ton cranes
Central Quay	710	16	Small craft berth alongside and stern-to; backed by warehouses
Northern Quay	South 140 North 710	— —	Depths alongside extremely shallow, constructed in two sections slightly inclined to each other

To the north of the harbour two L-shaped jetties, 180 yds. apart at their shoreward ends, provide further facilities for small craft.

Port Facilities

The port has two cranes, each with a 2-ton lifting capacity, and a hydrant on the town quay for watering ships. Several warehouses are arranged in rows parallel to the water-front and are served by a single-track metre-gauge railway. Vessels engaged in the currant trade load from lighters and small vessels; at other times throughout the year there is insufficient activity to justify any extension of port facilities.

The Town

Katákolon is officially the port of Pírgos, and was founded in 1857. The few houses lie at the foot of a low hill near the water-front which is bounded by a sea wall. Water supplies are reported to be scarce.

Trade

The town is unimportant except as the outlet for produce from the plains of Ilía, and is one of the very few ports of Greece where exports exceed imports.

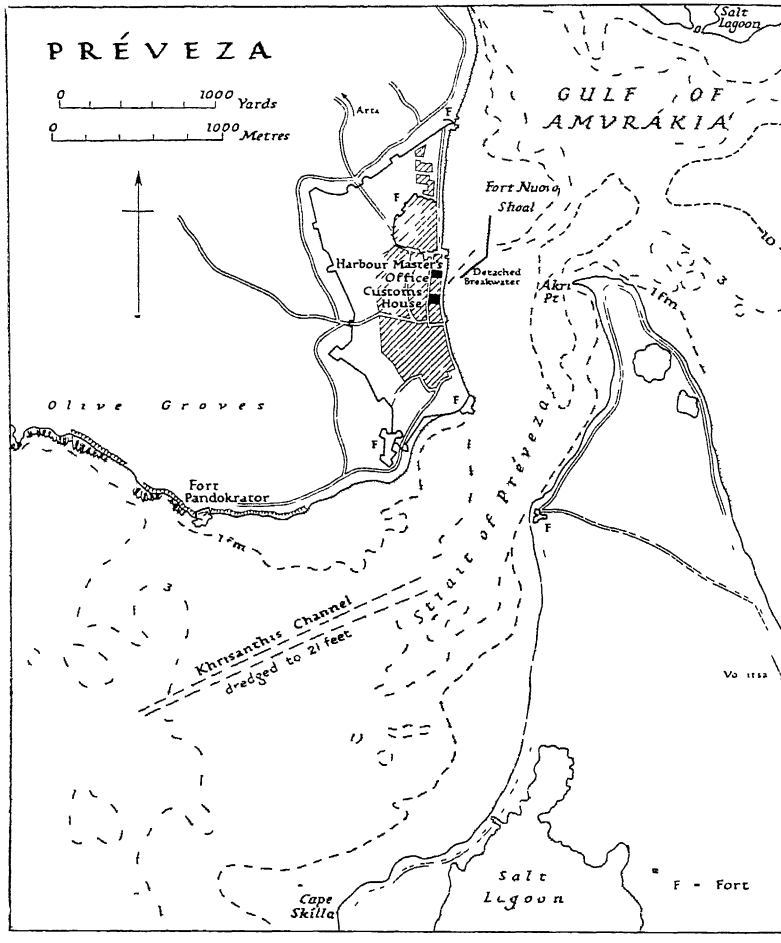


Fig 50 The port of Préveza

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs	9 0	Currants, raisins, etc	17 6
Sugar	0 6	Alcoholic drinks	5 9
Minerals (coal, cement, etc)	0 9	Chemicals	1 2
Chemicals	1 8	Miscellaneous	0 1
Miscellaneous	0·3		
Total	12·6	Total	24 8

Source: *Bulletin du commerce, loc cit.*

Katákolon handles a considerable proportion of the Pírgos currant production, the remainder being exported from Pátrai. About 100,000 net tons of shipping entered and cleared the harbour in 1938.

Communications

The port is connected by road and rail with Pírgos, some 8 miles to the east, and with Olimbía. The railway is a branch line of the P.A.P. system, and runs along the water-front to the southern breakwater. Frequent steamers provide a passenger route from Piraiévs: telephone and telegraph services are available.

Préveza

38° 57′ N., 20° 44′ E. Population 10,030

The small port of Préveza lies on the northern shores of the straits leading from the Ionian Sea into the Gulf of Amvrakía.

Approach and Access

The harbour is well sheltered, but the approach is difficult and demands careful navigation. The entrance to the strait, between Cape Skílla and Fort Pandokrátor is barred by a flat of coarse sand and gravel with depths everywhere less than 30 ft. Across it the Khrisánthis Channel leads north-eastwards, providing a dredged depth of 21 ft. with widths varying from 131 ft. in the south-west to 295 ft. in the north-east. Tidal streams frequently flow over the bar, changing in direction every six hours, but their strength and direction are determined by prevailing winds and are irregular.

Detailed Description (Fig. 50; Plate 67)

The port is practically undeveloped and has a total quay length of only 1,900 ft., of which some 1,000 ft. have a depth alongside of

25 ft. Off the northern part of the town a small harbour has been formed by the construction of a breakwater which extends north-eastwards for 520 ft. and then northwards, parallel to the shore for 625 ft. Depths within the harbour, which has an area of 17 acres, are only from 2 to 15 ft. The water-front of the town is quayed for 1,150 ft. with depths alongside of from 3 to 48 ft. Vessels usually load and unload with lighters from an anchorage in the bay.

Port Facilities

Port facilities are limited: there is one small hand-crane; about twenty lighters of up to 70 tons capacity are normally available for unloading and discharging; there are few warehouses, no coaling depôt, and only very small supplies of fuel oil. North of the town there is a yard for the construction and repair of small vessels, and sailing boats up to 100 tons have been built.

The Town

Préveza was founded by Pyrrhus about 290 B.C. in honour of Berenice, wife of Ptolemy I. It was occupied by the Venetians in 1499, and changed hands many times until Venice finally lost control in 1797. It then passed to the French together with the Ionian islands, but fell to Ali Pasha in 1798 and remained under Turkish domination until October 1912. Many ruined fortresses are witnesses of the long and restless history of the town, and to-day only the Venetian fortress stands as a formidable bastion. Most of the houses are of wood and the streets are narrow, uneven and usually unpaved. Water is carried in barrels from wells around the town. There is a small municipal hospital and part of the town has electricity.

Trade and Industries

Préveza serves the plain of Árta and the district of Ioánnina. It is used as a port of call by small vessels operating in the coastal trade of western Greece and the Ionian islands, and by passengers wishing to go to Árta and Ioánnina. Its freight traffic is small, exports not usually exceeding 1,000 tons. They consist principally of agricultural produce from the plain of Árta, such as olives and olive oils, butter, cheese, hides and wool. Imports in 1937 were almost 7,000 tons and comprised foodstuffs and provisions, coal and a small quantity of petroleum and textiles. There are no industries of importance.

Communications

Préveza has frequent steamer connexions with Kérkira, Pátrai and Piraiévs. The road to Ioánnina is reported to be in reasonably good repair, and normally has a motor service along it. There are no railways. A telegraph cable crosses the straits to Levkás

MAJOR PORTS OF THE ISLANDS

Between the mainland of Greece and the numerous islands of the Ionian and Aegean Seas a flourishing trade in goods and passenger traffic is carried on by small steamers and sailing craft. Using the tonnage of merchandise entered and cleared as a criterion, such island ports as Kérkira, Iráklion, Síros, Khaniá, Mitilíni, Khíos and Vathí (Sámos) rank amongst the most important in Greece.

KÉRKIRA (CORFU)

39° 36′ N., 19° 56′ E. Population 34,740

Kérkira is the chief town of the largest and most important of the Ionian islands. It has the greatest passenger traffic of all the island ports and on the basis of net tonnage entering and clearing it occupies the fifth position in the list of Greek ports.

Approach and Access

The island is separated from the mainland by Kérkira Straits, the navigation of which presents no difficulties to steam vessels. The town lies on the east coast of the island and is approached by a roadstead, protected from north-easterly winds by the islet of Vídho. It is open, however, to winds from a north-westerly or south-easterly quarter and at such times the working of cargo may be hampered and even suspended. Vessels unloading in the roadstead usually moor stern-to at the breakwaters and discharge into lighters. Anchorage is in stiff mud and clay in depths varying from 10 to 16 fathoms.

Detailed Description (Fig. 51; Plates 68 and 69)

The harbour lies between a detached breakwater-mole and the shore, and its depth is only sufficient for small vessels, ranging from 3 to 36 ft., with a depth of 6 ft. over the greater part of the area. The

breakwater-mole runs from east to west and consists of two separate sections, 650 ft. and 1,500 ft. long. It is built of rough stone blocks, but small vessels can unload on to the structure. Work on a new breakwater, which it was proposed to construct east from Kefalomándoukon, has not yet been started. Alongside the quay forming the water-front, north-west of the town, there are depths of from 9 to 10 ft. Two jetties project northwards from it for 250 ft. and can be used by small craft.

Port Facilities

Lifting appliances include a crane of 4 tons capacity on the customs house quay and two smaller cranes of 2 tons capacity. Normally there are numerous small tugs and lighters in the harbour and two 10-ton tank boats for supplying water. Small repairs to vessels can be carried out

History

Kérkira stands on the promontory to the south of the harbour. The smaller promontory to the east, terminating in Cape Sídhero, is occupied by the ancient Venetian citadel, now a barracks and military hospital. The town is separated from the citadel by a wide esplanade, while to the south it extends along the shore of Garítsa Bay to form the suburb of Garítsa (otherwise Kastrádhes). The rocky peninsula of Palaiópolis was the site of the original town of Corcyra (or Cercyra), the 'tail', founded by Corinth in the eighth century B.C. as a stepping-stone to Sicily and, in particular, Syracuse. The colony developed its trade and wealth rapidly, and broke with its mother-city; the help given by Athens to Corcyra against Corinth was an immediate cause of the Peloponnesian War in 431 B.C. The town ultimately passed into Roman and Byzantine hands and became involved in the complicated politics of the medieval Greek world. Kérkira (or, in the Middle Ages and later, Corfu, the 'crests', from the twin peaks of the citadel) was controlled by Angevins, Venetians, French, Turks, Russians, and, from 1815 to 1864 (when the Ionian islands were relinquished to the Greek Kingdom), by the British. In the war of 1914–18, the Serb army, assailed from the north, retreated across Albania, and in 1916 occupied neutral Kérkira, which became the seat of the Serb government until the end of the war.

The fifty years of British occupation have left good roads—though those of the town itself are narrow but well paved—buildings such

as the Royal Palace, formerly the Governor's Residence, numerous statues and monuments, and the game of cricket. Until the end of the eighteenth century the ruling class of Kérkira was strongly Italian by descent, and bilingual in speech; and even to-day Italian is still widely understood and there is a considerable Roman Catholic minority. In the Greek Church, Kérkira is venerated as the resting-place of the bones of the fourth century Cypriot St Spiridhon, brought thither in 1489, and carried solemnly through the town four times a year. There is a small Jewish colony in the town.

There are many churches, of which the tallest is that of Áyios Spiridhon; the cathedral is dedicated to Panayía Spiliótissa, 'Our Lady of the Cave'. Other buildings include those formerly associated with the Ionian University, now disestablished. There is a large public hospital, a prison, and a thermic bathing-establishment. Classical remains are scanty and only a few of the old Venetian houses survive in this attractive town.

Kérkira is the seat of an eparchy, nomarchy and demarchy, of an archbishop and of a Roman Catholic bishop. It maintains Courts of Appeal and of the First Instance: it has the direction of gendarmerie, and had the first *Astinomía* in Greece, trained in a Police College under British direction. The Library of the former Ionian University is preserved, and there is a small museum in the Palace Kérkira is also the seat of a School of Agriculture.

Trade and Industries

The trade of Kérkira is very similar to that of the other ports of Greece, the bulk of the imports coming from Greece itself. The exports are almost entirely made up of agricultural products, the chief of which are olives and olive-oil.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs and agricultural products	39 6	Olives and olive-oil	0 7
Sugar, etc	0 8	Fruit and vegetables	0 3
Timber and wood products	1·4	Timber and wood products	0 1
Minerals	1 0	Miscellaneous	0 3
Chemicals	0 3		
Paper and printed matter	0 6		
Textiles	2 6		
Miscellaneous	0·6		
Total	46·9	Total	1 4

Source *Bulletin du commerce, loc. cit.*

The disproportion between exports and imports, which is the characteristic feature of the commerce of Greece, is well marked in the case of Kérkira, and the port derives its importance not so much from the bulk of its trade as from its commanding position at the entrance to the Adriatic. A large number of Italian vessels trading between Italy and the Near East call at Kérkira. In 1938 the total shipping entering and clearing amounted to 1.5 million tons, one quarter of which was of Italian registration. The healthy climate and beautiful scenery of the island result in a considerable tourist industry—one of its principal sources of income—and large numbers of foreign travellers regularly visit the island. In 1938 the passenger traffic was 28,000 persons in both directions, only one half of whom had come from or were proceeding to Greece itself. The only industries of note are the large numbers of small plants existing for the extraction of olive-oil and the manufacture of soap.

Communications

Numerous roads traverse the island, a legacy of the British occupation, but the majority have been allowed to fall into a state of disrepair. The town has regular services to other parts of Greece and the Adriatic ports by Greek and Italian shipping lines. There is a cable service to the mainland and other Ionian islands.

Iráklion (Candia)

35° 20′ N., 25° 09′ E. Population 43,550

Iráklion is the largest town and the best equipped port of Kríti. By tonnage of merchandise handled it is foremost among the ports of the Greek islands, and is surpassed only by Kérkira in the amount of shipping that enters and clears.

Approach and Access

The harbour lies on the south-eastern shores of the Gulf of Iráklion, a broad inlet in the northern coast of the island. The gulf affords no dangers to navigation, and anchorage in 15 to 25 fathoms can be found in the shelter of the western shores. Elsewhere the gulf is exposed and in stormy weather large vessels frequently take shelter in the lee of Día island.

Detailed Description (Fig. 52; Plate 70)

The port has an inner harbour, accessible only to small vessels, and an outer harbour, larger but less well sheltered, to the east.

The outer harbour has an entrance width of 670 ft with a depth of 37 ft., decreasing to a general depth of about 22 ft. in the northern part of the harbour. The northern side is formed by a well-built breakwater-mole (7), which runs in a north-easterly direction for a distance of 3,110 ft. It is sufficiently broad (41 ft.) to take two-way motor traffic and vessels can lie alongside in over 27 ft. of water. The eastern side of the harbour is formed by a mole (6), some 1,900 ft. in length, but not sufficiently broad (24 ft.) for motor traffic In the south-west of the harbour a 400 ft. quay (4), with depths alongside of 18–20 ft., is used by small merchant vessels, and a new south quay (5), still in course of construction, is used by coasting vessels moored stern-to.

The inner harbour was the original port of Iráklion and is formed by two short moles (1 and 3), both of which run in a north-easterly direction from the town water-front. The entrance width is 150 ft., with a depth of 9–10 ft., and the harbour can only accommodate about a dozen vessels of from 100 to 150 tons. The following table gives details of quays in both the Inner and Outer Harbours. The numbers 1–7 refer to Fig. 52.

Details of Quays in Iráklion Harbour

	Length (ft.)	Berthing space (ft)	Depth alongside (ft)	Height above M.W.L.O.S.	Remarks
Inner Harbour					
1 North Mole	900	900	6–12	6	Shore end (250 ft) open timber piling Outer end (650 ft) masonry
2. South Quays	1,100	700	6–7	3–5	Masonry, 1 fixed 2½-ton crane
3 East Mole	980	680	9–12	6½	1 fixed 2½-ton crane
Outer Harbour					
4. South-west Quay	400	400	18–20	6½	Concrete blocks, 1 electric travelling gantry crane
5 South Quay Breakwater	1,550+	1,550+	18	6½	Concrete blocks; extensions in progress
6 East Breakwater-mole	1,900	1,150	16–27	6½	Concrete blocks; 1 electric travelling gantry crane
7 North-west Breakwater-mole	3,110	2,400	27–39	8	Concrete blocks, 1 electric travelling gantry crane

Port Facilities

Cargo can be discharged directly on to the breakwater-mole but elsewhere lighters are used and there are normally about twenty in the harbour. For the most part ships use their own derricks, but the port has probably five cranes (see table). There are at least four warehouses, cold storage at a distillery and ice factory in the town, and an area of some 9 acres near the south-west quay for open storage. Numerous slipways for small craft lie on the southern side of the outer harbour, and a machine shop that can undertake small repairs.

The Town

Iráklion commands the central corridor across the island between the mountain massifs of Ídhi and Dhíkti. Before its destruction in 1941 it had a wide main street leading from the quay to the centre, but this belied the general style of the town, which was a maze of very narrow and crooked lanes, partly of Turkish aspect, though lacking the minarets of its fourteen mosques. The Venetian remains included several fine fountains and the damaged *loggia*. There were eight Greek churches, including a modern cathedral; and there was a unique museum of Cretan (Minoan) antiquities, largely from Cnossus, some three miles away (see vol. I, p. 428). Other buildings included the Prefecture, a small hospital, barracks, a Roman Catholic monastery and church, and an Armenian church. Iráklion is the seat of the eparchy of Témenos, a nomarchy and a demarchy, and of the Archbishop of Kríti.

History

The town was founded by the Saracens in the ninth century as Kandak (whence the name Candia) and has had a chequered history. Under Venetian domination it grew to some importance and considerable traces of their occupation still remain in the fortifications that surround the town. It was finally captured by the Turks in 1669 after a three years' siege, and despite many insurrections they held it until 1912, when the island passed to Greece. During the German invasion of Kríti in May 1941, the town was almost destroyed.

Trade and Industries

Iráklion has a large volume of trade by Greek standards; it exports fruits, wine (the island was once famous for its malmsey), olives and olive-oil, and imports wheat and flour, timber, coal and petroleum. Most of its trade is with Piraiévs.

Trade in 1937 (*thousands of m tons*)

IMPORTS		EXPORTS	
Foodstuffs and agricultural products (chiefly wheat and flour)	10 4	Fruit, vegetables, nuts, etc.	22 2
Sugar	1·8	Olives and olive-oil	1 5
Timber and wood products	4 9	Alcoholic drinks	1 3
Minerals	1 5	Miscellaneous	0 3
Metal goods	0 7		
Chemicals	0 8		
Miscellaneous	0 1		
Total	20 2	Total	25 3

Source *Bulletin du commerce, loc. cit.*

The export trade is quite substantial, and for the year given exceeded the volume of imports. This position is most unusual for Greek ports, and unique in the case of the islands.

The industries are chiefly those relating to the processing of agricultural products and the town contains oil and soap refineries, tanneries, distilleries, raisin-drying establishments and mills.

Communications

Road communications are adequate, though there are several bad sections. The road to Pérama, Réthimnon and Khaniá is in good condition, though it is unsuitable for heavy motor traffic. A road runs south-westward across the island to Timbákion and another eastwards to Neápolis and Áyios Nikólaos; both of these can be used by motor traffic although their general condition is not good. Communication with other towns on the island is usually by coasting steamer, and a frequent service connects the port with the mainland of Greece. There are telephone and telegraphic communications with the important towns of Kríti; and Iráklion is connected by submarine cable with the mainland.

Síros (Ermoúpolis)

37° 26′ N., 24° 56′ E. Population 22,750

The small island of Síros, with its port of Ermoúpolis, is situated almost centrally in the Kikládhes. For many centuries it was the principal port of Greece, the crossing place of sea routes from the western Mediterranean to the Levant and the Black Sea, from Thrace and Macedonia to Crete and Africa, and, like Delos in the

age of classical Greece, the centre of the entrepôt trade of the many Aegean islands. But the rapid expansion of Piraiévs and other mainland ports from the last quarter of the nineteenth century gradually captured much of its trade, and to-day it has declined to the tenth place amongst all the Greek ports

Approach and Access

The coasts of the island are for the most part steep-to, but navigation is not without difficulties, for there are a few off-lying dangers and some parts of the shores are fringed by a narrow coastal bank. Ermoúpolis harbour lies on the eastern side of the island, partially sheltered from southerly winds by Gáidharos islet. Fair anchorage in depths of from 12 to 18 fathoms and shelter from north-easterly winds can be found between Gáïdharos and the coast of Síros to the south-west.

Detailed Description (Fig. 53; Plate 71)

The harbour is formed by a bay, open to the east. A small peninsula which projects southwards from the northern side of the bay has been elongated by a breakwater some 1,300 ft. in length. The entrance is about 900 yards wide and depths vary from 23 fathoms to just over 13 ft. near the sea wall of the commercial basin. Good anchorage is available within the harbour and there is protection from most winds, except those blowing from the north and north-east. These, however, are seldom strong enough to prevent operations within the port. Large vessels can moor with their sterns attached to the breakwater.

The port falls naturally into four parts: a commercial harbour in the north, a small harbour in the west, a boat harbour in the south-west, and an outer harbour immediately inside the entrance (Fig. 53).

The water-front of the commercial harbour is improved by a number of sea walls and quays that extend from the root of the breakwater around the northern part of the harbour. They provide some 3,700 ft. of berthing space in depths varying from 6 to 14 ft., although there are bollards for the end-on mooring of ocean-going vessels The harbour is principally engaged in handling the general commodities that make up the trade of Síros. The small harbour in the west, used for the repair of coastwise and fishing vessels, has depths of only 3 to 10 ft., though just to the north-east, where two quays provide some 850 ft. of berthing space, depths increase to

16 ft. In the south-west the boat harbour has several small piers, amongst which are some for ship repairs, one for quarantine and another for prison landings.

Port Facilities

Two 1-ton hand-cranes and one sheer-legs of 50 tons capacity are thought to be the only lifting appliances available, and there are normally about thirty-three lighters with a total capacity of 2,500 tons. There are no docks at present in the port, though it is reported that a dry dock has been authorized. Two slipways, the larger of which can haul up vessels not greater than 4,000 tons, are maintained by two local ship-repairing companies. The more important is owned by *Cie des Forges et Chantiers de Syra.* Facilities exist for coaling and taking on fresh-water

The Town

The town consists of three parts: the quayside quarter of Ermoúpolis, and, on two hills behind it, the old Catholic quarter (Áno Síra) on the southern hill, and the Greek quarter on the northern hill, Vrondádho. The Catholic population are the descendants of the Venetian and Genoese conquerors, who, after the Turkish occupation, lived under French protection. In 1821 they were reinforced by refugees from Khíos and Psára, who built Ermoúpolis and the Vrondádho quarter A Roman Catholic cathedral dominates the southern hill, and the Greek church of Anástasis the northern. There are two hospitals, with a total of 100 beds, a large orphanage and a small museum. Síros, besides being the capital of the island, is a nomarchy (Kikládhes) and a demarchy, it has an Orthodox archbishop and a Roman Catholic bishop. As the judicial centre for the Kikládhes, it has Courts of Appeal, of the First Instance, of a Justice of the Peace, and of Police. It controls the gendarmerie of the Kikládhes. The town has a good water supply and electric lighting extends to the water-front.

Trade and Industries

The trade of Ermoúpolis is derived mainly from its position as the centre of the coasting trade between the Greek islands, and to a less extent from the tourist traffic, not only from abroad but also from the mainland of Greece itself In 1938 the passenger traffic was about 23,000 visitors, and the total tonnage entered and cleared

was just under one million tons. The great commercial activity of the port dates from the influx in 1821 of Greek traders who were driven from Khíos by the Turks, but the gradual economic development of the mainland and the territorial expansion of Greece gradually removed it from its pre-eminent commercial position.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs and agricultural products	3·1	Minerals (stone, emery, etc.)	2·3
Sugar	0·4		
Minerals	12·5		
Leather and hides	0·1		
Miscellaneous	0·3		
Total	16·4	Total	2·3

Source: *Bulletin du commerce, loc. cit.*

A certain amount of industrial activity, though on quite a small scale, is carried on in the town. The spinning and weaving of cotton is the most important occupation and a certain amount of raw cotton is imported from Cyprus, Egypt and America. The port has good ship repair plants and the town is also noted for *loukoúmi* (Turkish delight).

Communications

There are a number of roads suitable for motor traffic in the southern part of the island. Frequent steamer services connect with other islands and with Piraiévs, and many foreign lines occasionally call. Telegraph cable services for the many islands of the Aegean are centred on Síros.

Khaniá (Canea)

35° 31′ N., 24° 02′ E. Population 36,810

Khaniá, the capital of Kríti, has only a small harbour and the port handles little more than 50,000 tons of cargo each year. Nevertheless, it is fourth amongst the ports of the Greek islands.

Approach and Access

The broad bay of Khaniá, on the north coast of the island, is entered between Cape Spátha and Cape Tripití, some 24 miles apart.

The coasts are bold and high and Khaniá has been built at the south-eastern head of the bay on the only maritime plain of any considerable extent. Navigation presents few difficulties, except in the western approach to the harbour, where there is a coastal bank on which lie above-water and sunken rocks. The regular passenger and mail boats anchor in the roadstead outside the harbour, where there is good holding ground in 20 fathoms. In bad storms, however, vessels normally go to Soúdha Bay, one of the safest and largest bays in the Mediterranean.

Detailed Description (Fig. 54)

The harbour is naturally poor and is formed partly by a ledge of rocks projecting westwards from the eastern promontory of a little bay. The ledge has been strengthened by a breakwater-mole on which a sea wall has been built. The entrance to the harbour lies between the end of the mole and the western promontory of the bay. A little less than 400 ft. in width, it has a central channel with a depth of 40 ft., but there is a marked shallowing immediately south of the entrance.

The harbour is divided into an inner and an outer portion by two short moles extending towards one another, and between which there is a passage of only 200 ft., with a depth of 15 ft. The outer, or western, harbour provides anchorage in about 20 ft. of water, shoaling rapidly towards the sides; it is exposed to dangerous swell during northerly gales and there are no alongside berths. The inner, or Venetian, harbour has a quay along its southern side suitable for the berthing of small vessels. In 1939 the western part of the inner harbour was dredged to a depth of 15 ft., but the general depths elsewhere are from 8 ft. to shoal. Dimensions and functions of the various quays, all of which are constructed of solid-filled masonry walls, are given in the table on p. 292. The numbers 1–7 refer to Fig. 54.

Port Facilities

Port facilities are few. There are said to be three floating cranes with capacities of 8, 6, and 4 tons respectively, a hand-operated crane of 2 tons capacity and a 3-tons crane. Along the southern side of the Inner Harbour there are numerous warehouses. The normal harbour craft consist of ten lighters of from 20 to 25 tons capacity, two of from 5 to 10 tons, one steam tug and two motor-boats.

Details of Quays in Khaniá Harbour

		Length (ft)	Berthing space (ft)	Depth alongside (ft.)	Remarks
	Outer Harbour				
1	West, south and east sides	2,200	2,200	5–7	Masonry, lighterage of general cargo, 1 hand-crane
2	South Mole	160 × 26	320	6–13	General cargo by coastal vessels
	Inner Harbour				
3	Main Quay	360	360	15	Masonry, general cargo and passengers from coastal vessels
4	Jetty—west side	40	40	45	Masonry wall, solid fill
	head	23	23	45	General cargo by coastal
	east side	160	160	15	vessels
5	Quay	520	520	4–5	Masonry, lighterage of general cargo
6	Jetty	50 × 50	150	3–4	Masonry, lighterage of general cargo
7	Quays	950	950	1–3	Masonry, small craft only

The Town

Khaniá was built by the Venetians in 1252 on the site of the ancient Cydonia (which gave its name to the quince), and was lost to the Turks only in 1645. It is compactly and solidly built, and is surrounded by massive and well-preserved Venetian fortifications, and on the southern side by a fosse, now dry and laid out with kitchen gardens. Most of its streets are narrow and crowded, but some have been lately widened; the houses, often wooden, are low and whitewashed. The new quarter, outside the walls, is regularly planned and the suburbs have grown rapidly through the administrative importance of the town.

Khaniá is the seat of government for Kríti, and is a nomarchy and demarchy. Here too is a suffragan bishop: there are consular offices, military establishments, and the higher directorate of gendarmerie. Its Courts include those of the First Instance, Appeal, a Justice of the Peace, and a Police court: there is, moreover, a Military court. Water is provided from springs in the suburb of Perivólia, at a place called Boutsounária, and from wells in the town Electric lighting is obtained from the water-power of Lake Ayiá, and schemes have been prepared for the development of hydro-electric power.

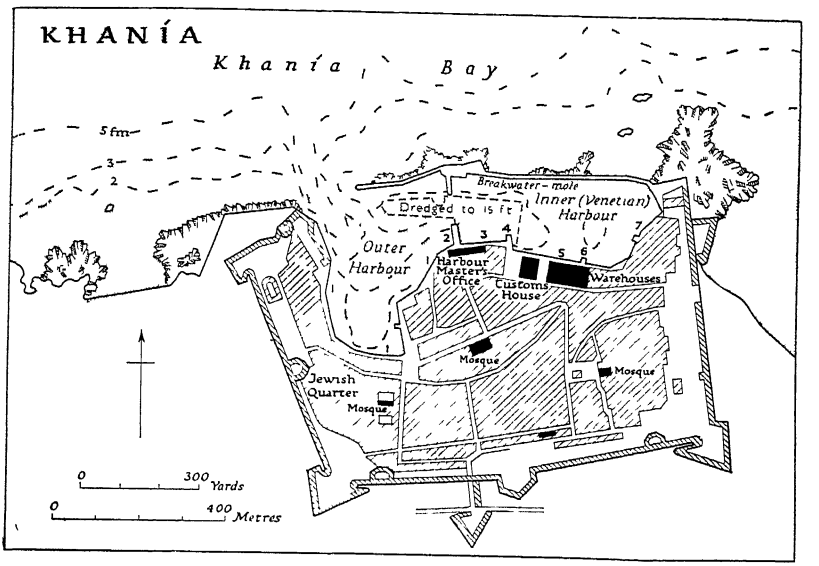


Fig 54 The port of Khaniá (Canea)

Outer Harbour 1 West, South and East quays, 2 South Mole *Inner Harbour* · 3 Main Quay, 4 Western Jetty, 5 South Quay, 6 East Jetty, 7 East Quays (details of these quays are given on p 292)

Trade and Industries

Khaniá is the centre of one of the richest districts in Kríti, and, although it is hampered by the lack of a good port, it has a considerable coasting trade Among its imports there is no outstanding commodity, but the bulk of the exports are olives, olive-oil and horticultural products.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs	12 5	Agricultural products	6 2
Sugar	1 6	Alcoholic drinks	0 2
Timber and wood products	1 9	Leather and skins	0 1
Minerals	0 4	Chemicals	0 2
Metals	0 6	Miscellaneous	0·1
Chemicals	0 6		
Miscellaneous	0 5		
Total	18 1	Total	6·8

Source. *Bulletin du commerce, loc cit.*

The town has important olive-oil and soap works, mills, tanneries, foundries, a government tobacco-cutting factory and a canning factory. There are, in addition, the native industries of cloth-dyeing, and wood, iron and leather working.

Communications

There is only one main exit from Khaniá, passing through the south wall of the town. This leads to the main motor road of the island, to Kastélli-Kisámou in the west and to Rethímnon and Iráklion in the east. A second road of poor quality strikes south-west to Selíno Kastélli on the south coast.

Mitilíni

39° 16′ N., 26° 32′ E. Population 34,600

The town of Mitilíni is the capital of Lésvos, the largest of the many islands in the eastern Aegean.

Approach and Access

Lésvos is separated from the mainland of Asia Minor by Mitilíni Strait, a narrow but deep stretch of water which has no navigational difficulties. The town of Mitilíni lies on a small peninsula on the

south-western shores of the strait, and on either side of the peninsula there is a small harbour. Large vessels cannot enter and usually anchor in the roadstead off the town, where, however, they are exposed to southerly winds.

Detailed Description (Fig. 55; Plates 72 and 73)

The northern harbour is the larger of the two, with an area of about 40 acres and a depth of 42 ft. across its 1,200 ft. entrance. It shallows rapidly towards the head of the bay and is therefore used only by small vessels. Some protection is given by two breakwaters composed of partially submerged boulders. On the west side of the harbour there is a quay, fringed with sunken rocks lying on a narrow bank; the southern shore is a gravel beach, and the eastern side is foul and dangerous.

The southern harbour is the more frequented and is used by vessels not exceeding 800 tons and with a draught of less than 16 ft. It is composed of an outer and inner harbour. The outer harbour is open to the south, but is protected on the eastern side by a breakwater-mole extending southwards for 1,500 ft. As yet it is unfinished and only the first 700 ft. from the root provide berthing space. The depths at the entrance are about 40 ft., shoaling to 6 ft. The coast on the south side of the peninsula is quayed. The inner harbour is open to the south-east and has an area of 23 acres; the entrance width is 330 ft. and is 22 ft. deep The following table gives details of the quays in the port:

Details of Quays in Mitilini Harbour

	Length (ft)	Berthing space (ft.)	Depth alongside (ft.)	Remarks
North Harbour				
1. Wooden Pier	180	200	0–10	General cargo
2. West Quay	1,300	500	6	Masonry (?)
South Harbour				
3. Breakwater-mole	1,500	700	24	Masonry blocks on rubble, not completed
4 Outer Quay	1,000	1,000	22	Masonry blocks on rubble base
5. East Quay	1,200	1,200	20	Masonry with concrete quay paving
6. North Quay	950	950	12–20	Masonry with stone quay paving, one 3-ton crane
7. West Quay	1,150	1,150	22	Masonry blocks on rubble base

Port Facilities

Normally there are about 70 fishing boats which can be used as lighters, about 35 lighters with a total capacity of 1,500 tons and ten pontoons with a combined capacity of 1,000 tons Apart from several

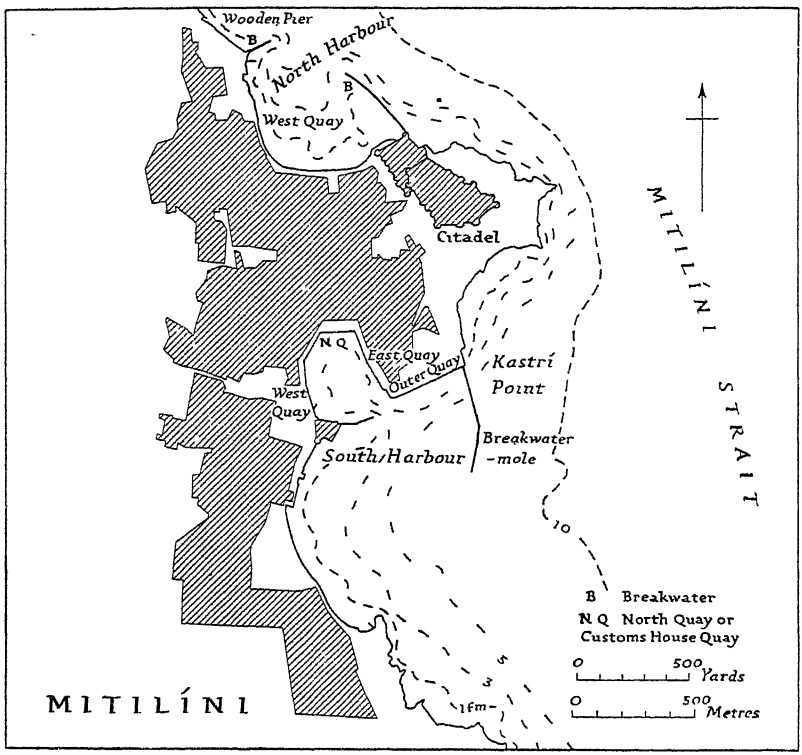


Fig 55. The port of Mitilíni

privately-owned warehouses in the town there are said to be 7 acres of open storage space on the harbour quays. Lifting appliances are limited to one crane of 3-ton capacity. There are no repair shops; supplies of coal and fuel oil are usually small and water is supplied by lighters.

The Town

Mitilíni is on the site of the ancient town; this was originally built on an island, which was later joined to the shore by a causeway, on

either side of which was a harbour. The peninsula so formed, with its medieval fortress (Kástro), is mostly uninhabited. The town extends from the neck of the isthmus to the foothills in a very attractive manner. Its churches include a cathedral, and there is a mosque. There are said to be two good hospitals. As a nomarchy the town controls not only its own island but also those of Límnos and Áyios Evstrátios: it is also a demarchy, and the seat of a bishop. Its courts of justice include the *Plimmeliodhikíon* for the eparchy of Límnos, as well as local courts. Mitilíni gets its electric lighting from a Diesel-operated plant of 1,350 h.p., and its water from the local Mount Ólimbos and from wells. Sanitation in the town is reported to be poor.

History

The ancient importance of Mitilíni arose from its position on the route to Troy: it was the centre of the Aeolian Greeks, the seat of the tyrant-sage Pittacus and the home of poets such as Alcaeus and Sappho. In the Middle Ages it was successively under the Seljuks, the Venetians and the Genoese family Gattilusio, from whom it passed to the Turks from 1462 to 1912, when it became Greek again.

Trade and Industries

There is a great disparity between the exports and imports of Mitilíni. Imports largely consist of essential foodstuffs like wheat and flour and such items as coal, timber and cement. Exports are very small in quantity and are largely taken up by consignments of olives and olive-oil.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Foodstuffs and agricultural products	11·2	Fruits and vegetables	0 4
Vegetable oils	2 0	Olives and olive-oil	1 0
Timber and wood products	2 5	Metals	0 2
Sugar, molasses, etc	1·1		
Minerals	0 6		
Chemicals	0 2		
Miscellaneous	0·5		
Total	18 1	Total	1 6

Source: *Bulletin du commerce, loc cit.*

The total tonnage of shipping entering and clearing was 0·6 million tons in 1938. In the same year the passenger arrivals were just over

21,000 and the departures were approximately 27,000 The only industries are olive pressing and oil refining, soap manufacture and carpet making.

Communications

Roads on the island are for the most part bad, but some are suitable for motor traffic, e g. the road from Mitilíni to Kalloní and Míthimna. Regular steamship services connect the port with Khíos, Piraiévs and Thessaloníki. There is a telegraph and island telephone service, and also a wireless station.

Khíos

38° 22′ N., 26° 08′ E. Population 28,160

The island of Khíos lies in the eastern Aegean and is separated from the coast of Asia Minor by Khíos Straits, only 5 miles wide in their narrowest portion. The town of Khíos is the most important settlement on the island, and on the basis of shipping its port ranks next to Síros, although its imports are much smaller.

Approach and Access

Khíos Straits are obstructed at the southern end by the islets of Páspargos and Panayía, but the passages between Páspargos and Khíos and between Panayía and Asia Minor are clear of dangers, except for narrow coastal banks. Northwards, too, the straits are comparatively free from dangers and provide numerous anchorages, although just to the south of Khíos harbour the coastal banks broaden almost to 1,000 yards. The northern entrance to the straits is obstructed by the Oinoúsai islands, but here also the passages are wide and deep and present no difficulties to navigation.

Detailed Description (Fig. 56; Plates 74 and 75)

The harbour is rectangular in shape and covers an area of 56 acres. It is entirely artificial and is sheltered by two breakwaters, each measuring about 2,000 ft. in length, and leaving an entrance channel 300 ft. wide. A depth of 25 ft. of water exists in the north-western section of the harbour; elsewhere there is a depth of from 10 to 12 ft., except along the southern quay and the two breakwaters. The sides of the harbour are quayed and measure in total some 5,000 ft. Vessels usually moor stern-to on the quays and discharge into

lighters There are few port facilities apart from two large warehouses and two hand-cranes of 3 tons capacity.

The Town

The charming little town is dominated by the thirteenth-century castle (Kástro), near which is the old Turkish quarter. One of the town's possessions is the Korais Library; it has a School of Agriculture, a hospital, a large leper-station, and an orphanage. Khíos is the seat of an eparchy and a nomarchy, of a bishop, and of a Court of the First Instance. It is a station for the Royal Hellenic Navy. The town is electrically lighted; the problem of getting enough drinking water at the height of summer is one that has engaged much attention.

History

Khíos, known commonly as Khóra, which claims to be the birthplace of Homer, and was certainly the place where the great modern Greek writer Korais (1748–1833) ended his days, occupies the site of the ancient town, famous for poetry and the arts and seamanship. In the course of a long and honourable history it has had many vicissitudes. With the break-up of the Byzantine empire in 1204, it came for a time under the Venetians, but these were replaced in 1261 by the Genoese, who, in spite of some minor incursions by Franks, Catalans and Turks, held the island firmly until 1566. During this period Khíos attained the great prosperity that was not wholly lost until the islanders revolted against their Turkish masters, who retaliated with the terrible massacre of 1822. In 1881 came a catastrophic earthquake; 56,000 people lost their lives, and the island was once more devastated. Khíos slowly recovered. In 1894 a French company secured a concession from the Turkish government to construct and operate the port: the work was finished in 1899. The island was returned to Greece in 1912.

Trade and Industries

The exports of Khíos include wines, fruit and vegetables, among which oranges and lemons are the most important individual items. The island is famous for its export of gum mastic, a resin from which a popular liqueur is distilled and which is used in the preparation of certain varnishes. Among the imports timber and wood are outstanding, considerable quantities of wood being used in the

manufacture of packing crates and boxes for the fruit export trade. In common with most of the ports of the Greek islands, a large proportion of its trade is handled through Piraiévs

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Live animals (number) 1,691		Fruit	6 8
Wheat, cereals and flour	1·0	Vegetable oils	0 2
Sugar	1 0	Timber	0 2
Leather and hides	1 2		
Timber and wood products	3 1		
Metal products	1 3		
Dyes and paints	1 1		
Miscellaneous	0 2		
Total	8 9	Total	7 2

Source *Bulletin du commerce, loc. cit.*

In 1938 the total shipping entrances and clearances amounted to almost one million tons and the passenger traffic to about 25,000 persons in each direction. A few small industries catering for local requirements operate in the town, but none is of great importance.

Communications

Several roads suitable for motor traffic traverse Khíos, and there are frequent steamer services to the other islands and to the mainlands of Greece and Asia Minor. Italian vessels trading with the Dodecanese frequently call at Khíos. Five cables provide telegraph communications with the mainland and other islands.

VATHÍ (SÁMOS)

37° 45′ N., 26° 59′ E Population 6,090

Vathí is the principal port of Sámos, a mountainous island in the eastern Aegean. It is the least important of the leading ports of Greece and the amount of cargo which passes through it is less than 20,000 tons per annum. The approaches to the island are clear of off-lying dangers and the coasts are generally steep-to.

Detailed Description (Plate 76)

Vathí Bay is on the north-east coast of Sámos and is backed by high, wooded country. Depths at the entrance are over 30 fathoms,

but towards the harbour at the head of the bay they decrease rapidly. Merchant vessels usually anchor off the town in from 3 to 10 fathoms of water. There are very few port facilities, except for a quay along the town water-front, where the depth is only 6 ft., and at which vessels lie stern-to.

The Town

The history of Vathí is closely connected with that of Sámos. In Ancient Greece the island had extensive commerce overseas and founded numerous colonies on the shores and islands of the Mediterranean (see vol. I, p. 442). From Byzantine times it passed into the hands of the Turks, when it suffered a great decline in population and wealth. In 1832, Sámos obtained some administrative independence, with a prince chosen by the Porte from the Christian inhabitants of the island. Finally it became part of Greece in 1912. To-day the town has certain administrative importance as the capital of the island and the seat of the nomarch. It consists of two parts, the port along the south-eastern head of the bay, and the town of Apáno Vathí on a hill dominating the harbour.

Trade

The trade of Vathí is small and its exports consist mainly of wine (for which it is famous), olive-oil, leather, tobacco and raisins.

Trade in 1937 (*thousands of m. tons*)

IMPORTS		EXPORTS	
Live animals (number) 1,323		Agricultural products	0 7
Foodstuffs	4 5	Alcoholic drinks	4 1
Alcoholic drinks	0 3		
Sugar	0 4		
Miscellaneous	0 1		
Total	5 3	Total	4 8

Source: *Bulletin du commerce, loc cit*

Communications

By Greek standards the island is comparatively well supplied with roads and two major routes strike west and south-west along the north and south coasts of the island respectively. The island has regular steamer communications with Marseilles, Piraiévs, Kríti, Egypt, and the neighbouring islands.

MINOR PORTS OF THE MAINLAND

Greece possesses a large number of small harbours and anchorages around her coasts at which small coasting steamers and caiques occasionally touch, and though individually they may be insignificant, collectively they play an important part in the communications of the country. The following eight ports, Kiparissía, Kórinthos, Krionéri, Mesolóngion, Návplion, Pílos, Stilís and Yíthion, may be noted as the most outstanding.

Kiparissía

37° 14′ N., 21° 40′ E. Population 5,260

Kiparissía is a small port engaged in the currant trade on the west coast of the Pelopónnisos. The harbour can only be used by small craft, or in summer by larger vessels which lie in an exposed anchorage to the west of the port. North-westerly winds make this anchorage unsafe (Fig. 57, Plate 77).

The harbour proper is formed by a breakwater 650 ft. long, which provides some protection from the south and west. Both sides of the breakwater are unfaced and it is unsuitable for berthing. To the east of the breakwater the water-front is irregular and rocky and cannot be used even by small craft The eastern side of the harbour is formed by a small jetty, 110 ft long and 50 ft. wide It provides the only berthing space in the port. There are no port facilities

The town is in two parts. The smaller part lies alongside the harbour; the larger part, some half a mile inland, rises in successive terraces and is dominated by the ruins of a picturesque castle that offered a vigorous resistance to the Venetians in 1205 and later fell to Geoffrey de Villehardouin. The town was rebuilt after its destruction by Ibrahim Pasha in 1825. The railway station at Kiparissía is the terminal point of a branch railway from Kaló Neró on the P.A.P. system, and poor but metalled roads run north to Pírgos and south to Methóni. A third road strikes inland to the Pámisos valley

Kórinthos (Corinth)

37° 57′ N., 22° 56′ E. Population 11,940

Kórinthos lies in the south-eastern corner of Kórinthos Bay, 2 miles to the south-west of the entrance to the canal (see p. 307). Despite the importance of its position, which commands both the land route from central Greece to the Pelopónnisos and the sea route from east

to west, the modern port is small and undeveloped. Anchorage may be found in fine weather in most parts of the bay.

Off the northern end of the town, a mole some 300 ft. in length extends north-eastwards and affords protection to the landing place for Kórinthos. This merely consists of two small wooden piers on its south-eastern side. The mole was in process of extension in 1939 and the foreshore to the south-east was being reclaimed.

The early greatness of Corinth as a leading city state and the centre of far-reaching commercial enterprises survived its destruction by Mummius in 146 B.C., but not the attacks of successive waves of barbarians during the break-up of the Roman Empire (see vol. I, pp. 429–30). To-day the trade of the port is negligible, and is limited to the export of small quantities of wine and the import of timber and rolling-mill products.

The modern town, which is not on the site of the ancient city, was built with broad streets on a rectangular pattern, after the disastrous earthquake of 1858 had destroyed the old settlement. It was again destroyed in 1928 and rebuilt on the former lines. The town has certain administrative importance as the capital of Argolís-Korinthía and the seat of an archbishop.

Communications are relatively good. Motor roads run west to Pátrai, south to Árgos and east across the Isthmus to Athens: the town is also the junction for the coastal railway of the P.A.P. system and the branch line to Trípolis.

Krionéri

38° 20′ N., 21° 35′ E.

There is no settlement at Krionéri worthy of mention, and the port merely consists of a pier on the Gulf of Pátrai suitable for lighters and small coastal vessels. Nevertheless, it is the terminus of the Agrínion railway, and, as such, it has achieved considerable importance in the passenger traffic. The port has regular steamer communication across the gulf with Pátrai.

Mesolóngion (Missolonghi)

38° 21′ N., 21° 17′ E. Population 10,000

Mesolóngion stands on the northern shore of the Gulf of Pátrai and serves part of Aitolía. Situated on a low point on the edge of extensive sandy flats and reclaimed marshland, it is distinctly unhealthy (Plate 78).

The port is approached by means of a channel 2½ miles long, 160 ft. wide, and with a minimum depth of 17 ft. The channel has been dredged across the shallow and extensive lagoon of Mesolóngion from just west of Tourlís islet to a small basin south of the town. The basin has a least depth of 19 ft.

The town is famous for the part it played in the War of Independence, when it became the chief stronghold of the Greeks in western Greece and offered a long and heroic resistance to the Turks. It was here too that Byron died in 1824. To-day it owes its importance to the export of wines and fish, as well as being the seat of the nomarch for Akarnanía-Aitolía and of an archbishop. It has a station on the metre-gauge railway line from Agrínion to Krionéri, and a causeway leads from the landing pier on Tourlís islet to the town.

NÁVPLION (NAUPLIA)

37° 34′ N, 22° 48′ E. Population 7,600

Návplion lies near the head of the Gulf of Argolís, and is one of the better ports of the Pelopónnisos, although its trade is small (Plate 79).

The harbour is on the northern side of a small rocky peninsula that extends westwards for some 800 yards (Fig 58). It is protected on the western side by a breakwater-mole, 520 ft. long, of which only the inner and shoreward end (280 ft.) is suitable for berthing vessels in depths of from 6 to 13 ft. East of this structure a quay fronting the town extends north-east for 900 ft. and is used by small craft lying stern-to in a depth of 6 ft. A central mole provides a further 720 ft. of berthing space, the outer face of which (250 ft.) has a probable depth of 19 ft. Eastwards, the town quay continues in a slightly irregular line for 1,730 ft. and is stated to have an alongside depth of 19 ft. In the angle between the peninsula and the mainland, i.e. to the east of the harbour, there has been some land reclamation, but the water-front has not been faced. Port facilities normally include two small cranes, a small supply of fuel oil owned by the Socony Vacuum Corporation, and several warehouses.

The harbour was the ancient port of Árgos, and was associated with Palamedes, the legendary inventor of, among other things, lighthouses and masts. The town was strongly fortified by the Venetians (see vol. I, p. 439), who held it from 1388 to 1540. After the War of Independence it became for a short time the capital of Greece (1829–34), and to-day it is important as the seat of the nomarch for

Argolís and of an archbishop, and for its law courts, arsenal and military barracks. The town itself is crowded between the fortress of Palamídhion (now used as a prison) in the south-east of the peninsula, the old fortress of Itch-Kale in the south-west, and the sea to the north. There has been, however, a more regular development to the east of the peninsula. Návplion is a charming, clean little town which has a small museum containing Bronze Age objects from Mycenae and other nearby sites.

The chief exports, as from other ports of the Pelopónnisos, are dried and preserved fruits, vegetables and some tobacco and cotton, and the industries, apart from a fish-canning factory, are associated with the agricultural produce of the plain of Argolís. The town is served by a branch line of the P.A.P. railway from Árgos, on the Kalámai-Trípolis-Kórinthos line, and there are regular steamer connexions with Pátrai and Piraiévs

Pílos (Navarínon Bay)

36° 54′ N., 21° 41′ E. Population c. 2,000

The town of Pílos is small and badly constructed, and what little trade there is consists of the export of currants. It lies on the south-western coast of the Pelopónnisos on the southern side of the most capacious harbour (Navarínon) in Greece (see vol. I, pp. 51–2 of this Handbook). The entrance to the bay is between Pílos islet, at the southern end of Sfaktiría island, and the mainland to the east (Fig. 59; Plates 80 and 81). The bay is exceptionally well sheltered and there is anchorage on a muddy bottom in an average depth of about 20 fathoms. Vessels are able to unload into lighters all the year round.

The small harbour of Pílos is immediately east of a stone jetty, 330 ft. long, 20 ft. wide and 4 ft. 6 in. above water level. The eastern side of the jetty is faced and is used by small vessels lying in 7 ft. of water; large vessels lie stern-to at the northern end of the pier. The landward side of the harbour is formed by three stone-faced quays, each 60 ft. wide and with a total length of over 900 ft., but the shallowness of the harbour limits their use to small craft. There are two other jetties in the bay, Yiálova jetty on the north-east coast, and the other on the east coast of Sfaktiría island. Both are well constructed, but the water alongside is shallow. Port facilities consist of an old mobile crane on Yiálova jetty with a lifting capacity of 1½ tons, two sheer-legs and a small number of harbour craft.

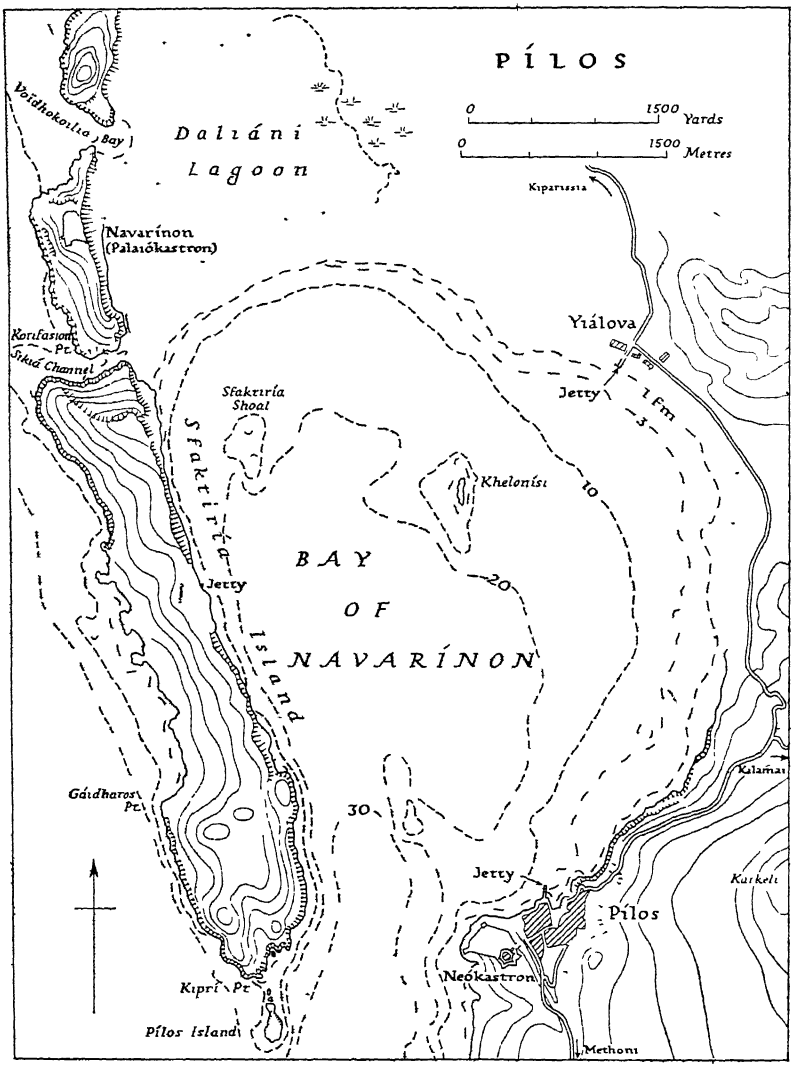


Fig. 59 Navarínon Bay and the port of Pílos

Navarínon Bay is especially famous for the momentous naval battle of 20 October 1827. On that day English, French and Russian squadrons, under the command of Admiral Codrington, sailed into the bay to persuade the Turks to an armistice with the Greeks. The parley ended in a general conflict, and by nightfall the Egyptian fleet, under its Turkish commanders, was destroyed. The battle saved Greece, for the Pelopónnisos was recovered from the Turks in the following year, and independence was soon achieved.

Communications with Pílos are poor; roads lead north to Kiparissía and south to Methóni; the nearest railway stations are at Kiparissía and Kalámai.

Stilís

38° 55′ N., 22° 36′ E. Population 2,727*

Stilís is a small port on the northern shore of the Maliaic Gulf, some 10 miles to the east of Lamía. The village lies at the head of a shallow bight and can only be reached through a narrow channel, dredged to a depth of 16 ft. There are practically no port facilities, apart from a quay which is used by fishing and small coasting vessels. A motor road follows the narrow coastal plain and joins Stilís with Lamía in the west and rounds the south-eastern slopes of Óthris to Pteleón in the east. The town is also the terminal station for the standard-gauge branch of the Piraiévs-Platí railway, connecting Stilís with Lamía and Lianokládhion.

Yíthion

35° 45′ N., 20° 34′ E. Population 9,600

Yíthion is the port of southern Lakonía, a rich and fertile plain. It lies on the north-western shores of the Gulf of Lakonía and is used mainly by coasting vessels operating around the Pelopónnisos (Plate 82).

The port is open to the east, but a certain amount of protection is provided on the south by a small island and the causeway that joins it to the mainland (Fig. 60). The best anchorage is in a depth of 17 fathoms between this island and the port. The harbour itself is protected from easterly winds by a mole, 450 ft. long and 40 ft. wide, both sides of which are faced. It is used by small coasting

* Greek government census, May 1928

craft, lying alongside in from 5 to 10 ft. of water, and by larger vessels which lie stern-to off the end of the mole. From the base of the mole a quay used by small craft runs westwards for 310 ft.; a second quay forms the landward side of the harbour running northwards for some 1,600 ft. Here, too, the water is very shallow. There are no port facilities, except for some small warehouses.

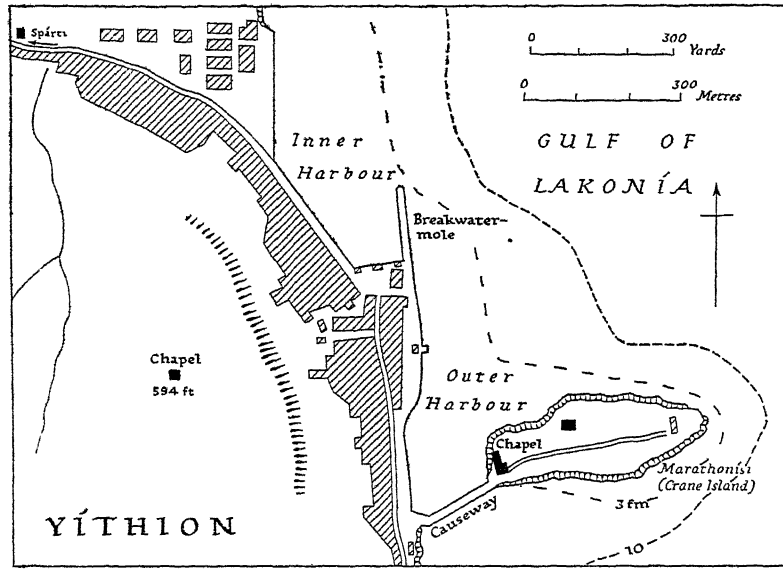


Fig 60. The port of Yíthion

Yíthion was a settlement in the Bronze Age, and during classical times; later it became the arsenal and port for Sparta. To-day, as in late antiquity, it is the exporting centre for the agricultural produce of the plain of Spárti. Exports include olives and olive-oil, currants, wine and silk, while wheat and wheat-flour, coal, cement and timber make up most of the imports. Industrial establishments consist of a number of small oil-pressing plants and factories for silk spinning and drying fruit.

There are no railways in this region and only two motor roads lead inland, one northwards to Spárti (28 miles), the other to Skála on the Evrótas (12 miles to the north-east).

THE KÓRINTHOS AND LEVKÁS CANALS

Kórinthos (Corinth) Canal (Fig. 61; Plates 83 and 84)

The Kórinthos Canal is the link between the Gulf of Kórinthos to the west and the Saronic Gulf to the east. It was cut in 1893 across the Isthmus of Kórinthos and is controlled by the small port of Posidhonía at the north-western entrance and by the port of Isthmía at the south-eastern entrance. Both ports were built after the opening of the canal.

The canal is just over 3 miles long. At either end there is a bottom width of 72 ft and a width at the water surface of from 165 to 230 ft. In the central portion (i.e. the middle two-thirds) the bottom width decreases to 69 ft. and that of the water surface to 81 ft. This is the highest part of the isthmus and the banks on either side of the canal tower above to a maximum height of 250 ft. The banks are faced with masonry for some 8 ft. above the water level. Nowhere along the canal is there a depth less than 26¼ ft. and dredging is carried out once a week. The tide makes a difference in water level at each end of the canal of not more than 20 in. Tidal currents are influenced by the prevailing winds, but their velocity rarely exceeds 3 knots and is usually less than 2½ knots. Vessels drawing up to 24 ft. are allowed to use the canal at all states of the tide, provided that their beam is not more than 46 ft.; vessels with a beam of up to 54 ft. 2 in. may pass if their draught is less than 20 ft. 4 in.

The saving of distance by using the canal is most marked in journeys from the Adriatic and west coast of Greece ports to those in the Aegean and Black seas: and, to a lesser extent, on voyages from the south coast of France and western Italy to the Aegean. The table on p. 308 shows the movement of shipping through the canal in 1937. Steam vessels may proceed under their own steam, but tugs are advised for the larger vessels; sailing vessels must be towed through.

The canal is crossed by a bridge 1½ miles from the north-western entrance. It is single span, 262 ft. long, and carries the P A.P. railway and the main road linking central Greece with the Pelopónnisos.

The small port of Posidhonía on the Gulf of Kórinthos is sheltered on the north and south by two arc-shaped breakwaters, 720 ft. and 785 ft long. The entrance width is 240 ft., with a depth of 33 ft.

Shipping Movements through the Kórinthos Canal, 1937

Flag	Steamers		Sailing vessels		Total	
	Number	Net tonnage	Number	Net tonnage	Number	Net tonnage
Greek	6,311	1,086,603	1,142	18,939	7,453	1,105,542
Italian	923	1,227,410	4	440	927	1,227,850
Jugoslav	114	63,152	—	—	114	63,152
Others	328	324,603	3	1	331	324,604
Total	7,676	2,701,768	1,149	19,380	8,825	2,721,148

Source *Annuaire statistique de la Grèce*, 1938, p 248 (Athènes, 1939)

shallowing towards the inner side of each breakwater. The village is tiny and the few houses lie on the southern side of the canal.

The port of Isthmía on the Saronic Gulf is protected on the north by a semicircular breakwater, 920 ft. long. Off the southern end of the breakwater is a charted depth of 29 ft., and 100 yards to the south it has decreased to 24 ft. The settlement is larger than Posidhonía and lies on the north side of the entrance to the canal (inset, Fig. 61; Plate 83). Communications are maintained by ferry boats worked on chains which can be sunk to allow vessels to pass.

The Levkás Canal (Fig. 62; Plates 85 and 86)

The mountainous island of Levkás is separated from the mainland of western Greece by narrow mud flats in the north and by Dhrépanon Bay in the south. The mud flats are crossed by the Levkás Canal, cutting northwards for a distance of some 3 miles from the long narrow head of Dhrépanon Bay to the southern shores of Dhérmata Bay. The depth in the middle of the channel is maintained by dredging to 15 ft.; the bottom width is 48 ft., and the surface width 96 ft. Depths decrease with northerly winds and increase with southerly winds, but the variation is not more than 1 ft. Currents vary with the prevailing wind and are from $\frac{1}{2}$ to $1\frac{1}{2}$ knots. The channel is marked by buoys, but its deeper parts are more clearly defined by the light yellow colour of the water. The nature of the shores on either side of the canal are shown on Fig. 62.

The northern entrance lies between a breakwater-mole and a citadel. The former structure is 1,200 ft. in length, and is quayed on the inner side, offering temporary berthing space to vessels

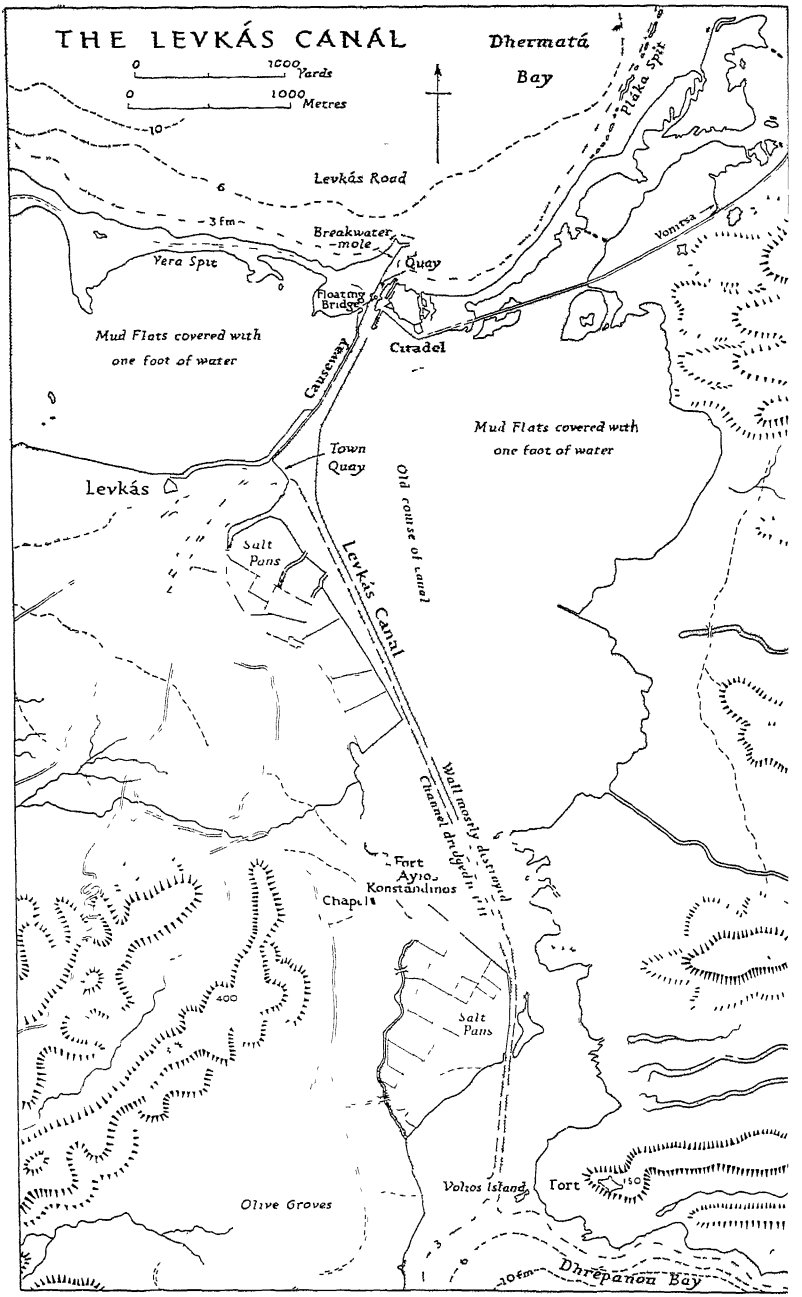


Fig. 62. The Levkás Canal

drawing not more than 15 ft. The citadel is quayed for 200 ft. on its western side, where cargo can be landed for use on the mainland. A floating bridge crossing the canal just below the citadel provides access between the mainland and the road carried on the causeway to the town of Levkás.

The southern entrance to the canal lies between two ruined moles covered by from 4 to 10 ft. of water. Between them is a width of 165 ft. and a depth of 23 ft.

The town of Levkás, near the northern entrance to the canal, is the largest settlement on the island, with a population of just over 5,000 inhabitants. The people are mostly engaged in the extensive olive-groves, vineyards, salt pans and fisheries near the town. The harbour is a triangular enlargement of an angle in the Levkás Canal and covers an area of some 15 acres. Vessels drawing less than 13 ft. can moor at the town quay, where there is berthing space of 420 ft. and one crane of 1½ tons capacity. Larger vessels lie in the Levkás Roads in the south of Dhérmata Bay and discharge into lighters

Bibliographical Note

1 Much of the detailed information in this chapter is based on official sources Apart from charts published by the British Admiralty (London) and the Hydrographic Service of the Royal [Hellenic] Navy (Áthens), details of which are given in vol I, pp. 406–9, the chief sources are the *Mediterranean Pilot*, vol III, 7th ed. (London, 1943) and the *Mediterranean Pilot*, vol. IV, 7th ed. (London, 1941) The first gives a short description of the ports of western Greece and the Ionian islands, the second of eastern Greece, the Aegean islands and Krítı More complete, however, are the four volumes of *Navtilıakaí Odhiyíaı ton Ellınikón Aktón* (Greek Sailing Directions) A, B, Γı and Γıı (Athens, 1937–39), published by the Hydrographic Service of the Royal [Hellenic] Navy They are very fully illustrated with charts of small areas, harbour plans, and sketches.

2 Specialized articles on a number of the Greek ports are to be found in the numerous technical publications given below:

Iráklion *Civil Engineering*, vol. XXVI, pp 40–3 (London, 1931).
Katákolon· *Tekhnıká Khronıká*, vol XVII, pp 423–30 (Athens, 1940).
Kaválla· *The Dock and Harbour Authority*, vol XI, pp 235–9 (London, 1931).
Khíos. *The Dock and Harbour Authority*, supplement to vol XI (London, 1931)
Pátrai *Le Géne Civil*, vol CV, pp 219–30 (Paris, 1934)
Piraiévs. *Le Géne Civil*, vol CV, pp 219–30 (Paris, 1934).
Special Register Service of Information, Department of Overseas Trade (London, 1932)
The Dock and Harbour Authority, vol XI, pp. 135–44 (London, 1931).
Thessaloníkı *Bautechnik*, vol. XVI, pp 65–7 (Berlin, 1938)
Le Géne Civil, vol CV, pp. 219–20 (Paris, 1934).
Tekhnıká Khronıká, vol. XIII, pp 349–52 (Athens, 1938)

3. Statistics of shipping and commerce are given in summary form in the *Annuaire statistique de la Grèce* (Athènes, annually), and in more detail in *Statistique du mouvement de la navigation* (Athènes, annually) and *Bulletin mensuel du commerce special de la Grèce avec les pays étrangers* (Athènes, monthly) The December edition of the commercial bulletin has summarized trade returns for the whole year The most detailed statistics for the port of Piraiévs are given in *Statistique du mouvement maritime et commercial, Administration du port du Pirée* (Athènes, annually)

4. Many books and guides may be consulted for the history and description of the towns of Greece For a full list of these, see p. 389.

Chapter IX

ROADS

Historical Background. Road Construction and Transport Conditions Highway Administration Road Traffic Regional Description Bibliographical Note

The roads of Greece reflect the poverty of the country in both their number and quality. At the end of 1938 there were 8,374 miles of roads, representing 0·17 miles of road per square mile, while in England and Wales, the combined area of which is only slightly larger than that of Greece, there are 2 64 miles of road per square mile. Comparative figures for other countries are given in the following table, which shows that the average for Greece is low even for the Balkans, while in terms of population the country is still more poorly supplied with roads:

	Miles of road per square mile	Number of inhabitants to each mile of road
Greece	0 17	830
England and Wales	2 64	267
Scotland	0 86	192
France	1·84	107
Germany	0·73	528
Italy	1·05	339
Spain	0 33	374
Jugoslavia	0 27	591
Bulgaria	0 49	328
U S A.	0 46	109

The best roads in Greece are with few exceptions only equal to minor English roads and, owing to the lack of funds, their upkeep and maintenance is generally very much neglected, unless they are of outstanding importance. The mountainous nature of the country is inimical to the development of what might be termed a network. The general trend of the mountains normally restricts movement to NNW.-SSE. directions, but roads frequently encounter subsidiary spurs or ranges at right angles to the main trends. This type of country, with its many steep gradients, presents, however, fewer technical problems to the road engineer than to the railway engineer,

and with the advent of the automobile in Greece, the railways have suffered severe competition.

Historical Background

Unlike Great Britain and France, Greece has no legacy of roads from the past and such roads as have been constructed were designed for present-day needs. Three routes, however, have always been of outstanding importance in the history of the country. The first was in use some 2,500 years ago. In order to avoid a long sea journey round the Pelopónnisos and to avoid the dues charged by Corinth for crossing the Isthmus, merchandise shipped from the west coast of Greece or the Greek colonies in Sicily or Italy was landed at Itéa in the Gulf of Kríssa, on the northern shores of the Gulf of Kórinthos. Thence it was taken overland via Ámfissa to reach the sea near Thermopylae on the Maliaic Gulf, or, alternatively, to proceed directly into Thessalía. With the completion of the Kórinthos Canal in 1893, the route, which had continued to be used as a short cut, lost much of its value.

The second road, the Skironian road, was perhaps a more famous road in antiquity. It ran from the Isthmus of Kórinthos to Mégara and Attikí along dangerous cliffs which descended steeply to the sea. For a considerable distance the road was confined to a narrow ledge and its course is followed to-day by the main Elevsís-Kórinthos road

The third road and the only Roman road of note in Greece was the *Via Egnatia*, which ran from Durazzo on the Adriatic Sea across Albania and Makedhonía to Thessaloníki. It traversed the town from north-west to south-east and its name is still retained in one of the principal streets (see p. 246). From Thessaloníki the road went along the southern shores of Lake Korónia and Lake Vólvi to Stavrós and then along the coast to Kaválla. After crossing Dhitikí Thráki to Alexandroúpolis, it turned inland and ran north-eastwards along the Évros valley to Orestiás and ultimately to Constantinople, thus linking the Western and Eastern Roman Empires. Modern roads follow this route along several sections.

Of other roads existing to-day, the oldest are perhaps those on the Ionian islands of Kérkira, Kefallinía, Itháki, and Zákinthos. These fertile and prosperous islands have the densest network of roads to be found anywhere in Greece and they date from the British occupation of the islands during the first half of the nineteenth century. They were the only real roads which Greece had for several

decades after the cession of the islands to Greece in 1864. The period between 1885 and 1893 saw the construction of many roads as well as railways, but after the country went bankrupt in 1895, little was done until the war of 1914–18. When a road and a railway served the same route, the railway obtained all the traffic and the road tended to fall into disuse and disrepair. During the war, the Allied campaign in northern Greece from 1915–18 caused many changes in the systems of land transport in Greece, and the first real roads were built. Not only were roads built or improved in Macedonia for the use of motor vehicles, as both a supplement to and an augmentation of the railway facilities, but roads were also improved or rebuilt in other parts of Greece, so that as little dependence as possible need be placed upon sea transport, which was open to attacks from enemy submarines. The utilization of the old route from Itéa may be quoted as an example of the shortening of sea routes. Stores and supplies for the Allied armies were landed at Itéa and taken in motor lorries to the small station of Brállos on the main railway line from Athens to Thessaloníki.

In the period immediately after the war, such roads as existed fell into a lamentable condition. Little repair work was done and even in the Athens-Piraiévs region, roads were almost impassable. For some time the undertaking of public works construction such as road-building was hampered by the unsettled political conditions in the country. Few governments remained in power long enough to set the necessary machinery in motion. Nevertheless, the use of motor traction, introduced effectively for the first time during the war, increased in and near the towns and on a few main roads, but the absence of good country roads hampered the development of a means of transport which had greater potentialities than those of rail transport. The increase in traffic was partly responsible for the spending by the government, under General Pangalos, of some 80 million drachmae on road construction during the latter part of 1925 and the early part of 1926. The plan included the repair of all old roads and the construction of new ones to link the main provincial towns. However, when General Kondilis came to power in July 1926, strict economies were imposed and road construction was suspended.

It became more and more necessary that a comprehensive national road scheme should be prepared, especially in order to facilitate the economic exploitation of the country and so improve the national economy. In 1927 the government adopted an elaborate programme for road-building over a period of some six years, and during 1928

it was actively pursued. Agricultural areas were to be opened up to provide more land for the refugees from Turkey, and a new Greek loan was raised to provide simultaneously for road construction and for land reclamation in the Axiós and Strimón valleys. It was estimated that the road system would make available for cultivation 11,250 square miles and increase the value of the agricultural production of the country by one-third. The scheme was to link the main provincial towns or centres of agricultural production with the ports and urban centres of consumption. Mining districts were also to be included, while a second part of the scheme was to link the secondary towns with the main provincial towns. The contract for the work was given to the *Prometheus Co.*, which represented the *Asiatic Petroleum Co.* and had British financial backing. The scheme did not, however, prove altogether satisfactory, and work was suspended in 1932 owing to the economic depression. At that time only one-third of the projected road mileage had been completed. In 1933 and 1934 work was gradually restarted on a revised scheme, first on the main highways (in central and northern Greece) and then on minor roads. A total of 1,050 miles of new roads was to be constructed at a cost of 900 million drachmae, of which over half was provided by the *Prometheus Co.*

By 1936 the improvements in the road system had caused a considerable increase in road traffic, in such a manner as to make it a serious competitor of the state- and privately-owned railways. In many cases the roads were more direct and served better the needs of trade; in addition motor omnibus services competed directly with railway services. At the end of 1936, the government introduced a series of measures to prevent the further growth of this competition, and a Ministry of Railways and Road Transport was created. Long-distance commercial road haulage was taken over by the state, to be operated by an autonomous corporation similar to that of the state railway. A number of other measures, such as the imposition of a road tax on motor omnibuses and petrol-driven lorries by kilometre, were designed to restrict the radius of activity of road transport companies, to confine long-distance haulage to the railways, and to make road services subsidiary and complementary to railway services. The proceeds from the road tax were assigned to the railways.

Between 1938 and 1940, the ten-year plan of the Metaxas régime was vigorously pursued, and it made considerable progress; it provided for road construction costing 2,328 million drachmae out of a total cost of 7,324 million drachmae for all public works, which

included railway improvements, land reclamation, drainage and irrigation A considerable mileage of military roads was also included in the scheme; most of them were to be built in the north, but only a small percentage was completed by 1940. All new roads had to be constructed for two-way traffic.

Road Construction and Transport Conditions

Road Surfaces and Materials

Western European standards do not apply in visualizing the roads of Greece, for there was no first-class arterial road with multiple traffic lanes in existence prior to the outbreak of war in 1940. While Greek roads may be described as second class, even the main Athens-Thessaloniki road had in 1940 a few stretches where two-way traffic was impossible. Moreover, the traffic capacity of many of the roads varies from season to season Road construction has generally lagged behind the requirements of the fast-increasing motor transport activity.

Greece has never been able to afford the construction of really modern roads capable of taking sustained heavy goods traffic. The majority of the roads are only lightly metalled and liable to break up very quickly under abnormally heavy traffic. Hence, careful driving is necessary even on the best roads, and since rough patches are frequently encountered, the roads are most suitable for vehicles with a high clearance, such as lorries. Weather conditions also exaggerate these conditions and the roads need constant maintenance and supervision. In 1939, when the mileage of roads had reached 8,440, only 185 miles were tar-macadam, bituminous-concrete or asphalt-surfaced concrete roads. A bituminous-concrete surface is one consisting of a mineral aggregate bound together by a bituminous binder. These types of surface were only applied to roads of exceptional economic, tourist or strategic importance. Some 1,191 miles were of surface-treated and penetration macadam. The normal types of metalling on the remaining 7,064 miles of roads were water-bound macadam (in which stone fragments are consolidated by a mixture of water and earthy material or rock particles) and improved gravel or earth surfacing. In the case of the former, the foundation in most parts of the country is of solid rock, but the metalling is usually rough and loose. Constant maintenance is necessary to keep these roads in good condition, and this applies especially to those under

snow during the winter. Thorough overhauls are usually needed each spring, but in practice, few roads received them regularly.

The rocky nature of much of the surface of the country supplies abundant road-making materials. However, except where the plains are stony or gravelly, road materials in these areas have to be brought from fairly long distances Asphalt is the only important road material which Greece imports, and it is mostly obtained from Egypt. The government interest in the prospecting for oil in Ípiros in 1939 by the *Western Greece Oil and Asphalt Co.* was not solely concerned with the discovery of petroleum resources, which in themselves were significant for the expansion of motor transport in a poor country. In addition, the possibilities of exploiting the deposits of bituminous-impregnated strata were explored (see p. 139). At many places in north-western Greece, seepages of heavy oil are found, which all have a naphthenic or asphaltic base, and they are consequently suitable for the production of high-grade asphalt. Thus road-making material which is essential to modern roads might be recovered within Greece and would obviate the necessity of importing it. Other asphaltic deposits occur in the western Pelopónnisos. As cement is produced in the country (see p. 135), it is likely to have a considerable future as a road material.

There is very little modern road-building equipment in Greece. Imports in recent years have been negligible; some idea of this may be obtained from an official announcement of 1937 which invited tenders for eight concrete mixers and eight stone crushers with an additional quantity of road drills and air compressors. Otherwise the chief imports have consisted of steam rollers and tar sprinklers. Hand labour is much used and enjoys some preference because it gives employment, especially in the case of local roads. Labour is organized by villages, which supply parties of old men, women and children for work in the vicinity. They have practically no transport and little equipment save shovels, barrows and hand rammers. They can do no more than fill pot-holes and widen the road by increasing the earth berm or verge.

Gradients, Widths, and Load Capacities

Owing to the broken nature of the country, there are practically no roads of any considerable length which do not contain steep mountain sections, and successive hairpin bends are frequently encountered, often with embanking walls on the angle of the bend. The roads are, however, generally well engineered and graded, and

in most cases a gradient of 1 in 12 has been fixed as a maximum, though it has not been always possible to adhere to this and gradients of 1 in 10 are found in places; gradients steeper than this are rare.

A law enacted in 1927 laid down that National roads should be 6 metres in over-all width, with 4·5 metres of tarred surface. In practice this rule does not apply, as may be seen from a comparison of Fig. 63 with the regional road maps (Figs. 64–7). Only in relatively few cases do the National roads conform to these specifications. The main roads are, however, best classified on the basis of width, though this is usually a dry-weather classification, and those 6-metre roads shown in Figs. 64–7 are capable of taking two-way traffic, mostly at all seasons. The roads of 4–6 metres width are in some cases capable of taking two-way traffic; a number are also found which can take two lines of traffic in dry weather, but in wet weather the traffic capacity is limited to one line, because the unmetalled edges become unserviceable through mud.

The maximum load capacity of any Greek road is 25 tons. This capacity applies to the main Athens-Thessaloníki road throughout its length, except for a short stretch near Thessaloníki, where the capacity is only 18 tons. The road from Athens via Elevsís and Kórinthos to Trípolis in the Pelopónnisos has also a capacity of 25 tons. The remaining six-metre roads have only capacities of 18, 9 or 5 tons. The 4–6 metre roads generally have capacities up to 9 tons, and occasionally lower load capacities in winter. Some of the minor roads have load capacities of less than 5 tons in the winter and rarely have capacities above 9 tons. It may be expected that the roads in this category are at times impassable for motor traffic and can then only take pack animals.

Bridges

The numerous deep and precipitous ravines and gorges occupied by swift torrents, which are met with on most roads, have necessitated the construction of many bridges, though on bad roads and in remote districts the bridges are often washed out by heavy rains or are entirely non-existent. Thus, on many by-roads, fords are a more usual type of river crossing, and though these are dry and usable in summer, they are usually impassable in winter. Ferries also may be found on some of the larger rivers, especially near their mouths where the currents are not so strong. Many of the country bridges are not suitable for motor traffic. Almost all the bridges on the

main roads are one-way only, irrespective of road width. Numbers of old Byzantine or Turkish bridges are still to be found built of stone with a single, high-pointed arch. Those suitable for motor traffic cannot take more than five or six tons, especially those which have not been reconstructed. More recent bridges are made of iron, though before 1940 the standard type of bridge being built was a simple ferro-concrete structure. Some of the recently-constructed strategic roads in the north have bridges of this type, which are designed to take 14 tons (Plates 87–92).

There are very few signposts in Greece, but those that there are have distances marked in kilometres, as the metric system is used officially.

Effects of Weather

Weather conditions, especially those of the severe winters, play a much more important part in road passability in Greece than in most European countries, owing to the generally poor nature of the roads themselves and to the accidented relief of much of the country which they cross.

Snow falls every winter in the north of Greece and falls are likely to occur in the mountains between late October, or more often November, and April. On some sections of the main road system, snow may lie to a depth of some feet, but not for more than short periods, except in a few cases where the passes are blocked throughout the winter months. Roads at altitudes above 750 metres (2,500 ft. approx.) are affected mainly, though this figure varies according to aspect and location. The 800 metre (2,624 ft.) contour is shown in the regional road maps (Figs. 64–7) in order to give an approximate indication of the roads liable to be affected by snowfall, and the chief sections where road blocks of snow occur, regularly or irregularly, are also shown. The heaviest snow is encountered in north-west Makedhonía, though in the valleys it usually melts fairly quickly. In severe winters, deep snow up to 6 ft is liable to isolate some districts in northern Greece, and certain roads such as those from Ioánnina to Kalabáka and those in Dhitikí Thráki leading to the Bulgarian frontier are impassable for periods from November to February. Blizzards may occur once or twice a year and interrupt road traffic over wide areas for a few days. Melting snow may cause floods, as in late January 1940, when floods interrupted road communications for three days and also carried away part of the Athens-Thessaloníki railway line, which took ten days to repair Roads in

the mountains above the snowline need constant attention, for every winter the surface degenerates under the compacted snow.

Ice conditions are rare and of short duration in southern and central Greece, but in the north ice may prove a difficulty to road transport throughout January and February. On north-facing slopes in the mountains, frost is liable to make mule-tracks dangerous between late November and the end of February. Minor landslips and falls of scree often occur owing to the normal processes of weathering (water percolation and frost action) which are usual in mountain regions, thus causing temporary road blocks of quite large boulders (Plate 93).

In the mountains, too, the roads are often deeply scoured and broken by the torrential streams which flow down steep hill-sides after heavy falls of rain in winter. Swollen rivers frequently abandon their courses and cut into the roads alongside or into the bridges which span them. Such major repairs to the damage caused by snow and rain as are possible are usually carried out in the spring, though many stretches remain impassable for motor-cars because of the low clearance of these vehicles. Lorries, however, can normally pass under these conditions.

Heavy and frequent falls of rain in March and early April make the roads slippery and reduce them to muddy lanes, except in the case of tar-macadam roads. Hot sunshine after such rain produces a sticky clay surface which often prohibits movement without chains even on metalled roads.

In summer, when there is no constant supply of moisture available to consolidate the metalling, the roads in the lowlands become very dry and dusty. During this season traffic usually loosens the metalling, so that damage is more easily caused by the few summer thunderstorms than by the heavy falls of rain in winter.

Highway Administration

The roads of Greece are divided into three categories: (1) National, (2) Departmental and (3) Communal or Municipal roads. The Ministry of Communications is responsible for the construction and maintenance of the National roads (Fig. 63), and the National Road Fund is administered for this purpose. These roads, however, do not always conform to the nominal specifications (see p. 317), and they show great variety in condition in different parts of the country, partly owing to the lack of administrative co-ordination. Some miles

of roads in the islands are National roads, but none of them is in a good state of repair. The trunk roads of the mainland are all National roads. The maintenance of Departmental roads is the responsibility of the *eparkhía*, with assistance from the National Road Fund, while the maintenance of the Communal roads, generally consisting of work by parties of villagers, is undertaken by the *koinótis*. The last two categories have been grouped together as Local roads in Fig. 63, as no details of the distribution of each type are available, but they clearly take the form of roads which are subsidiary to the National system. Local roads of nominally the same category also vary much in quality, for here there is much more scope for indifference on the part of the local authorities. The main roads in the larger towns are usually in fair condition, whether National roads or otherwise; street improvements in the cities can be financed by special taxation of the inhabitants. The funds available in rural areas are naturally very meagre, in many cases because the roads traverse sparsely populated country. The mileage of each category of road in each *dhiamérisma* and *nomós* is shown in the table on p. 321.

Road Traffic

Since coastal shipping has traditionally been the means of internal communication in Greece, there has been little incentive to create a large-scale road transport system. In recent years, however, there has been a striking increase in motor traffic in the country. In general a railway system is more useful for long-distance haulage and is quicker than road transport. On the other hand, road transport is much more convenient for short distances owing to its flexibility, and by 1936 had reached a position strong enough to divert traffic from the railways, on both long- and short-distance routes, and cause a deficit in their receipts. Road transport in Greece is now subsidiary to the railway systems, but it is being used to some considerable extent on short hauls where it is partly taking the place of coastal shipping in the internal distribution of merchandise. Since the main urban centres of Greece are not far from their ports, it is on these routes that motor transport is fulfilling the greatest need.

There are no figures available to illustrate the increase in road traffic in the last ten years or so, but some indication of it may be obtained from the statistics relating to the number of vehicles. In spite of import restrictions which have been in operation for some

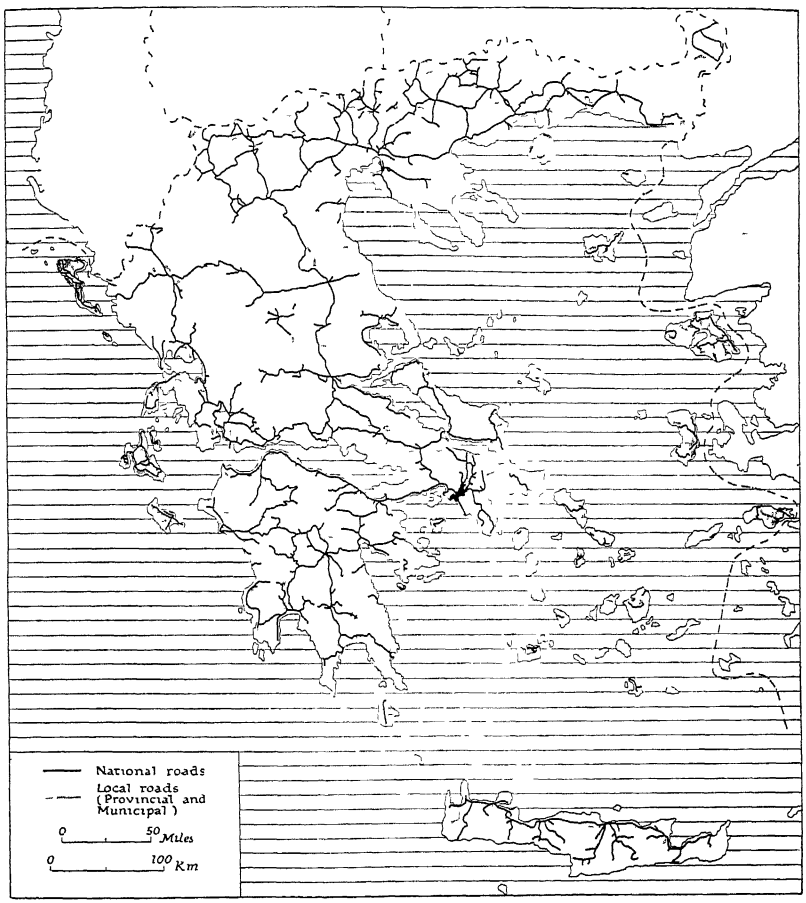


Fig 63 The distribution of National and Local roads
Based on *Khártis Odikoú Dhiktíou Elládhos*, 1 500,000, published in six sheets by the Ministry of Communications (Athens 1936)

Dhiamerísmata and *Nomoí*	Area—sq miles	Roads (miles)				Miles of roads per sq mile of area
		National	Provincial	Municipal	Total	
Central Greece and Évvoia	*9,704*	*1,212*	*362*	*59*	*1,636*	*0 17*
Aitolía-Akarnanía	2,991	311	33	37	382	0 13
Attikí-Voiotía	2,585	369	225	—	594	0 23
Évvoia	1,658	164	28	16	209	0 13
Fthiotis-Fokis	2,467	368	76	6	451	0 18
Pelopónnisos	*8,356*	*1,167*	*481*	*60*	*1,709*	*0 21*
Argolís-Korinthía	1,787	226	45	12	283	0 16
Arkadhía	1,670	304	50	8	360	0 22
Akhaía	1,140	156	25	9	190	0 17
Ilía	827	103	72	—	176	0 21
Lakonía	1,452	164	176	30	371	0·26
Messinía	1,474	214	113	1	329	0 22
Kikládhes	*1,021*	*31*	*15*	—	*46*	*0 04*
Kikládhes	1,021	31	15	—	46	0 04
Ionian Islands	*751*	*339*	*370*	*147*	*856*	*1 14*
Zákinthos	157	52	59	10	121	0 77
Kérkira	245	127	117	84	328	1 34
Kefallinía	347	160	194	53	407	1 18
Thessalía	*5,207*	*428*	*142*	*2*	*573*	*0 11*
Lárisa	2,942	291	102	2	395	0 13
Tríkkala	2,264	137	40	—	178	0 08
Makedhonía	*13,360*	*1,223*	*168*	*68*	*1,462*	*0 11*
Dráma	1,349	86	—	7	93	0 07
Thessaloníki	2,435	300	23	32	355	0 15
Kaválla	836	123	35	—	158	0 19
Kilkís	968	109	—	—	109	0 11
Kozáni	2,398	157	11	—	168	0 07
Pélla	1,082	77	29	18	124	0 11
Sérrai	1,565	139	5	—	145	0 09
Flórina	1,352	197	60	11	269	0 20
Khalkidhikí	1,236	35	5	—	41	0 03
Áyion Óros	130	—	—	—	—	—
Ípiros	*3,688*	*331*	*108*	*72*	*511*	*0 14*
Árta	671	54	16	—	70	0 10
Thesprotía	615	32	8	—	40	0 06
Ioánnina	1,955	138	41	61	240	0 12
Préveza	443	107	43	11	161	0 36
Kríti	*3,234*	*543*	*165*	*67*	*780*	*0 24*
Iráklion	988	180	38	22	244	0 25
Lasíthi	737	94	16	—	111	0 15
Rethímni	582	118	22	14	154	0 26
Khaniá	926	151	89	31	271	0 29
Aegean Islands	*1,506*	*267*	*240*	*54*	*563*	*0 37*
Lésvos	835	143	146	36	326	0 39
Sámos	321	54	53	4	112	0 35
Khíos	348	70	41	14	125	0 36
Dhitikí Thráki	*3,313*	*185*	*19*	*27*	*231*	*0 07*
Évros	1,634	87	2	—	89	0 05
Rodhópi	1,679	98	17	27	142	0 08
Total all Greece	50,143	5,737	2,082	559	8,374	0 17

Based on *Annuaire statistique de la Grèce*, 1939, pp 233–4 (Athènes, 1940)

The slight discrepancies in the totals are due to conversion from metric units to the nearest whole number in English units

time, and particularly since 1932, there were five times more cars, twenty times more lorries and fourteen times more omnibuses in Greece in 1935 than there were in 1920. There were some 17,000 vehicles registered in 1927, but the import restrictions of 1932 and 1933, when imports of cars fell to just over 100, caused a drop in the number of vehicles in use; imports, however, increased steadily up to 1940. While there were in 1938 about 14,000 vehicles in circulation, in 1940 the total number of motor vehicles was approximately 15,500, of which 7,000 were motor cars, 6,000 were lorries and 2,500 were omnibuses. There were also 1,500 motor cycles. All vehicles must be imported and not even spare parts are manufactured in the country. Cars must be cheap and at the same time have a high clearance, good springing and efficient cooling and braking systems. About 80% of the vehicles are of American manufacture, and the considerable number of taxis were nearly all made in the United States and the *Ford Company* has set up an assembly and repair plant in Athens. Omnibus services are quite well developed and most places which have roads have bus services as a means of communication (Plate 94); many of these are run by the railway companies. Outside the chief towns, bicycles are rarely used. The greater part of the local traffic in rural Greece is still carried by ox- and horse-drawn wagons or small carts, and by pack animals, including mules, donkeys, ponies and, rarely, camels.

Compared with other Balkan countries, Greece has a high percentage of motor vehicles. There is one vehicle to every 496 inhabitants, while Jugoslavia has 1 to every 1,034 persons and Bulgaria only 1 to every 1,484 persons. Similar figures in the case of Germany are 1 to 44, the United Kingdom and France both 1 to 19, and the U.S.A. 1 to every 4 persons. There is little doubt, however, that considerable long-term reconstruction will be necessary if suitable conditions for modern road transport are to be permanently present in Greece.

Drivers are scarce in the country, especially professional drivers. High license fees limited the number of non-owner drivers before 1940, a factor that proved a severe handicap to the Greek army in the campaign against Italy of that year. Filling stations or shops for major repairs and servicing are relatively uncommon outside the larger towns.

The relief of the country exercises a profound control on routeways and in few countries is this so well demonstrated as in Greece. The Píndhos range has long been a barrier to communication between eastern and western Greece, not only because of its height, steep escarpments and almost impassable ravines, but also because considerable areas are under dense forest. At present, the range is only crossed by the one-track road from Ioánnina to Kalabáka via Métsovon, which uses the Zigós (Métsovon pass—highest point over 5,200 ft.) to reach the upper Piniós valley. A road has been partly completed between Karpenísion and Agrínion, which will eventually provide a route across the southern Píndhos from the Maliaic Gulf and the Sperkhiós valley to that of the river Akhelóös. Except for the stretch between Lamía and Karpenísion, which is barely a two-way road, it is a one-way route. The only other road linking eastern and western Greece north of the Gulf of Kórinthos is that which skirts the northern margins of the gulf between Levádhia and Návpaktos and Mesolóngion. Elsewhere, many examples may be quoted where the roads are restricted to clearly defined natural routeways.

The general features of the road system may be seen in the table on page 321, which gives the general road density in each administrative area and the mileage of each type of road. The division into the three categories does not, however, give any indication of the relative conditions of the roads in various parts of the country. For convenience of description, the roads may be considered upon the following regional basis: (1) Eastern Makedhonía and Dhitikí Thráki; (2) Western Makedhonía and Ípiros; (3) Thessalía and Central Greece; (4) the Pelopónnisos and (5) the Ionian Islands, the Kikládhes and Eastern Aegean islands. Roads leading inland from the major ports of Greece are described in chapter VIII, and those serving other coastal districts in vol. I, chapter II, of this Handbook.

(1) *The Roads of Eastern Makedhonía and Dhitikí Thráki* (Fig. 64)

The density of roads in the provinces of Makedhonía and Dhitikí Thráki is smaller than the average for Greece as a whole, though individual *nomoí* have densities higher than the average. This density is a reflection of the physical and economic geography of the region, with its barren uplands of crystalline rocks and its carefully

cultivated and well-populated basins, settled largely by Greek refugees from Anatolia. Movement along many of the roads in this part of Greece is made difficult or impossible in winter, owing to heavy rain or snow, and even near Lakhanás, on the pass through the hills between Thessaloníki and Sérrai, chains are needed.

The three peninsulas of Khalkidhikí have very few roads and the Aktí (Athos) peninsula has none whatever, though a road has recently been built to Políyiros and this road is linked by a one-way road to Ierissós at the head of the Aktí peninsula which will ultimately serve the whole peninsula. Many of the best roads in Makedhonía around Thessaloníki were built by the Allies in the war of 1914–18, but in some cases they have been allowed to decay. Between Thessaloníki and the Turkish frontier a number of strategic roads have been built, in general striking northwards from the coast to the Bulgarian frontier; the usual practice was to metal them to within a short distance of the frontier, and they were banned to ordinary traffic: the road running north from Sérrai through the Rúpel gorge was, however, the exception to this procedure. The main road in this region is that running from Thessaloníki to the Turkish frontier. It leaves Thessaloníki to the north and runs north-east via Lakhanás over a saddle about 1,950 ft. high to Sérrai in the Strimón valley. There are a number of modern concrete bridges on this route, especially over the Strimón and its associated drainage canals. The major bridge over the Strimón itself, just east of Strimonikón, collapsed in part soon after it was first built. It is a reinforced concrete bridge with nine major and thirty-four minor spans. An alternative road to Sérrai from Thessaloníki passes through Nigríta; in dry weather it is a two-way road. The Strimón valley forms the most westerly of the five main routes running north to Bulgaria. The road using this valley is a good all-weather road and it passes north towards Sofia via the Rúpel gorge, the most difficult section lies astride the frontier between the Belashitsa and Tsingélion mountains. Sérrai is linked with Dráma to the east by a good two-way road, using the Angítis gorge between the Menoíkion and Pangaíon masses. From Dráma a road runs north-west to the frontier over the mountains. East of Dráma the roads all come within the 4–6 m. width category, since they are only fit for two-way traffic in dry weather, a good road, passable for two-way traffic, in parts at all seasons, runs south-east from Dráma to Kaválla, where it is joined by the Thessaloníki-Amfípolis-Kaválla road. The latter follows the route of the Roman *Via Egnatia* along the depression

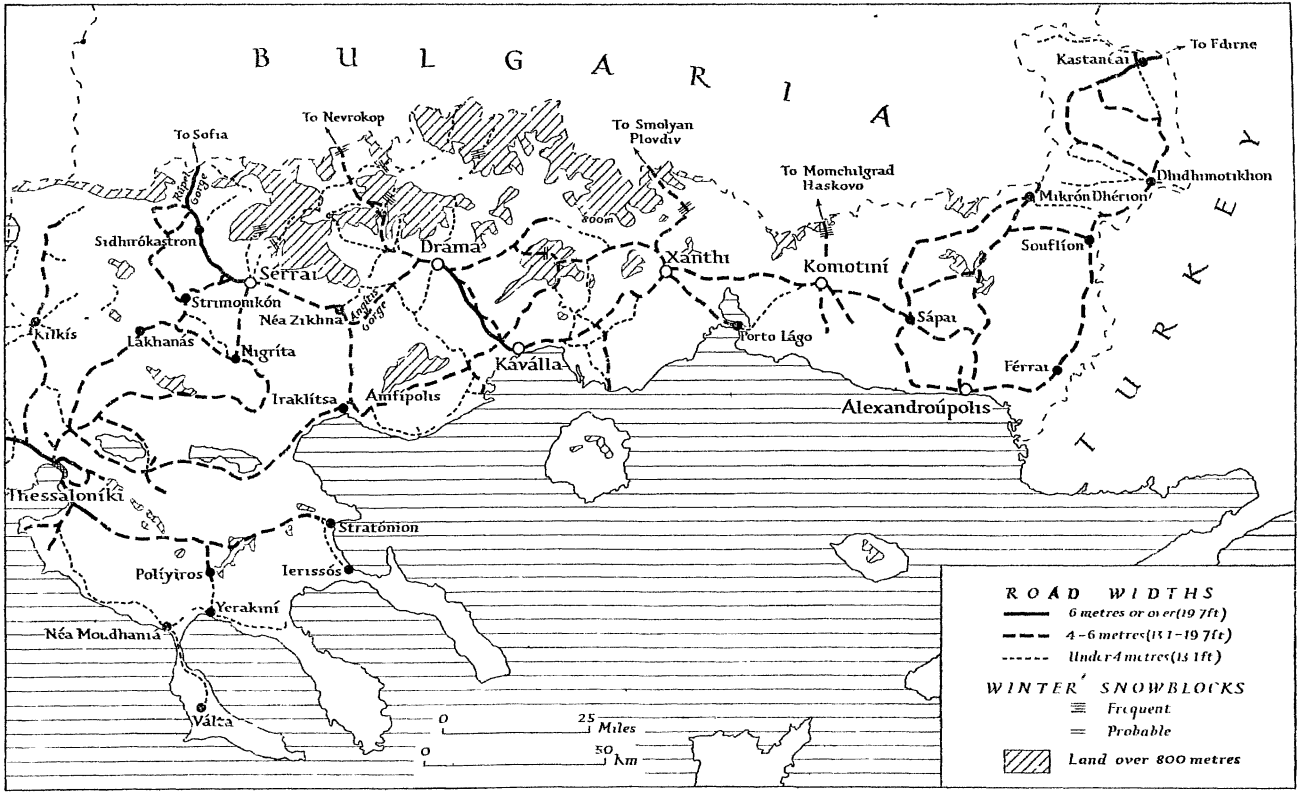


Fig 64 The roads of north-eastern Greece
Based on official sources, 1943.

occupied by Lakes Korónia and Vólvi to Amfípolis at the mouth of the Strimón, and then runs to Kaválla, separated by a line of hills from the coast. The port of Kaválla is not served by a railway as are the inland towns of Sérrai, Dráma, Xánthi and Komotiní, so that its road connections are likely to increase in importance. The road from Kaválla to the mouth of the Évros river and the Turkish frontier now follows the coastal plain, though it turns inland to Xánthi and Komotiní, hugging the base of the hills and avoiding the marshy and wet areas around the Néstos delta and Lake Vistonís. An alternative road between Xánthi and Komotiní bends south to Pórto Lágo on the coast, from which it runs along the narrow neck of land separating Lake Vistonís from the sea. From Pórto Lágo to Komotiní, however, the road deteriorates and is passable by one line of traffic in dry weather only. Between Komotiní and Alexandroúpolis the main road turns south to the coast again. From Alexandroúpolis it runs east and then north-east along the right bank of the Évros until it crosses the Turkish frontier to Edirne, recrossing the Turkish-Bulgarian frontier later. Difficulties may be caused by flooding along the Évros valley.

Two mountain roads run north from Xánthi (Plate 95) and Komitiní to the Bulgarian frontier, but both, like the road northward from Dráma, may be closed for periods during the winter owing to their elevation A road running north from Alexandroúpolis to Mikrón Dhérion, and so across the frontier, links up with a number of military roads built after 1940

(2) *The Roads of Western Makedhonía and Ípiros* (Fig. 65)

These two sections are effectively divided by the northern Píndhos. In western Makedhonía there are two of the most important natural routes leading north from Greece towards Central Europe, both into Jugoslavia; and in Ípiros, there is an important parallel route into Albania.

Thessaloníki is the natural route focus for western Makedhonía in particular, and for the whole of north and north-eastern Greece in general. From this city, the Axiós (Vardar) valley provides one of the easiest routes into Jugoslavia and was used in the Allied drive to the Danube in 1918. The French built a military road in 1917 along the valley from Yéfira to Évzonoi near the Jugoslav frontier, but after 1918 and up to the outbreak of war in 1940, partly because a railway served the same route, little was done to the road; it became worn to its 1917 foundations, although it was the most direct route

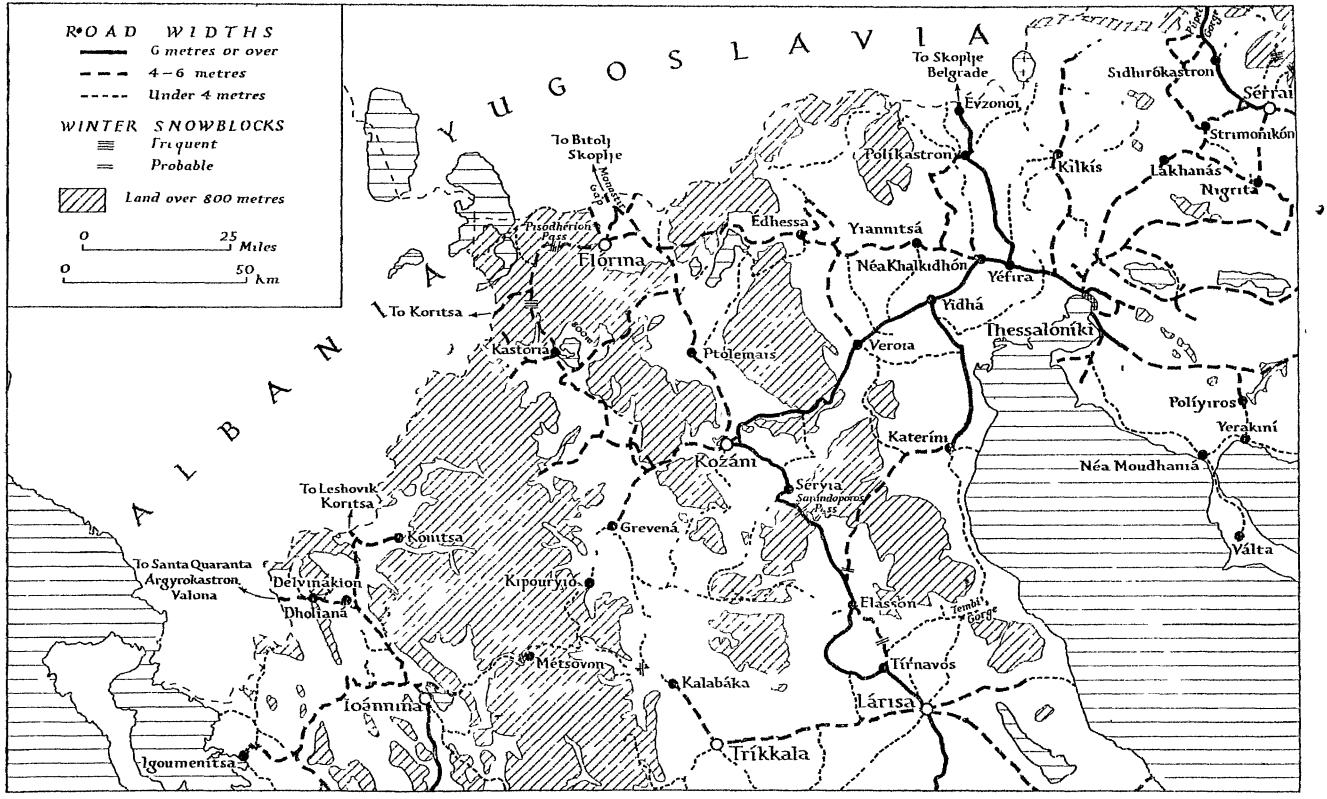


Fig. 65. The roads of north-western Greece
Based on official sources, 1943.

from Thessaloníki to Belgrade (via Skoplje). Indeed, in dry weather, cars preferred to use earth tracks alongside the road. The road has recently (1942) been reconstructed as a six-metre wide road, though it can be used by two-way traffic only in dry weather. There are a number of well-metalled roads radiating from Thessaloníki, including that north-west to Yéfira and Néa Khalkidhón; from the latter the main road into Albania from Greece runs west across flat country north of the drained area of Lake Yiannitsá to Édhessa, from which it climbs through mountainous country to Flórina and then to Koritsa (Korçe) in Albania. For most of this route, the road is passable for two-way traffic in all weathers, but the pass near the village of Pisodhérion, between Flórina and the Albanian frontier and at the head of the Lerínska and the Livadhopótamos valleys, attains an altitude of over 5,000 ft. and may be blocked by snow any time between the beginning of December and the end of March. Whenever a severe storm occurs, the road is liable to be under 6 ft of snow for some two and a quarter miles on either side of the head of the pass. Day after day, the road has to be cleared, generally for one line of traffic with passing places, as sunny days are commonly followed by heavy snow at nights

To the east of Flórina, the Albania road crosses the main road from southern Greece and Thessalía to Jugoslavia. This road runs from Kozáni northwards across the frontier to Bitolj (Monastir), using the Monastir gap, it is passable at all times but becomes muddy in parts during the winter and can then only take one-way traffic. Two alternative one-way roads, open all the year, also run from Flórina to Bitolj; one of these is under local administration.

The main Thessaloníki-Athens road, which is by far the most important in Greece, provides a through route between southern Greece and Makedhonía It diverges from the Édhessa-Flórina road at Néa Khalkidhón and runs in a south-westerly direction to Véroia and Kozáni, where it turns south-east towards Lárisa. It is a two-way road practically throughout its length, with sections of good metalling. Between Véroia and Kozáni, which is an important road junction, the road has to negotiate high sections up to 4,600 ft. that may be snowed up in winter.

A one-way road running south-west from Kozáni crosses a pass under 2,300 ft. high north of the Voúrinos massif and south of the Siniátsikon range and then crosses the Aliákmon to Grevená and Kipouryió; it is under construction to the Ioánnina-Métsovon-Kalabáka road, which links the plain of Thessalía with Ípiros. The

Ioánnina-Kalabáka road was completed in 1939, but the pass over the Píndhos mountains is liable to be snowbound in winter. Ioánnina is the chief road centre of Ípiros. From here a road runs north-west to a fork near Dholianá, from which one branch runs north to Leshovik and Koritsa in Albania, while another runs north-west along the Dhrino valley in Albania, to Argyrokastron (Gjinokaster) and Valona (Vlonè), while a branch runs south-west to the port of Santi Quaranta (Sarandè). These are the only real roads running into Albania from western Greece. A road running west from Ioánnina down the Thíamis valley to the port of Igoumenítsa offers direct communication between the shores of the Ionian Sea and Thessalía and the Aegean Sea. All these roads north and west from Ioánnina are two-way roads in dry weather A good road (6 metres wide) runs south from Ioánnina to Árta, but, though it is suitable for two lines of traffic, its load capacity is only 5 tons. The road forks south of Néa Filippiás, one branch crossing the Loúros river and running east to Árta, and then to Amfilokhía on the south-eastern shores of the Gulf of Amvrakía, and the other running west and then south to Préveza; this road keeps to the base of the hills as far as possible, in order to avoid the marshes and floods of the northern shore of the Gulf of Amvrakía, and it runs on a causeway for the most part. A one-way all-weather road runs north-west from this Préveza road, it follows the coast for a short distance and then, striking inland to cross the Akhéron river above its marshy mouth, it joins the Ioánnina-Igoumenítsa road

(3) *The Roads of Thessalía and Central Greece* (Fig. 66)

The main highway feature of these provinces is the Athens-Thessaloníki road, which traverses the whole region in a roughly north-south direction. The other important roads all branch from this trunk road. Thessalía has a smaller density of roads than the country as a whole, but Central Greece has the same average density In the latter, however, Fthiótis-Fokís and Attikí-Voiotía have higher densities, the latter naturally because of the concentration of roads round Athens. The roads in Central Greece are probably the best in Greece and their surfaces are generally fairly good, for considerable maintenance has been devoted to them in recent years (Plates 96–102).

The Athens road runs south-east from Kozáni to Lárisa. In doing so, it crosses the Aliákmon river and climbs over the mountains to

the north-west of the Ólimbos range, which presents a considerable barrier to north-south communications. The road uses the Sarandáporos pass (3,117 ft.) between Sérvia and Elassón. Snow lies on it often from December to March. The approaches on both sides of the pass zig-zag and are steep, with gradients of 1 in 7 on the northern approach and 1 in 6 on the southern side. The road crosses a further pass before descending into the plain to reach Lárisa. A number of roads converge upon this town, including the one-way road from the west following the Piniós valley for the latter part of the route from Ioánnina and Tríkkala, and a similar road from the port of Vólos to the south-east. This road is being reconstructed, in view of the growing needs of this port. It would seem that a simpler route for the Thessaloníki road from Lárisa would be through the Témbi gorge to the north-east, which is cut by the Piniós south of the Ólimbos range on its course to the sea; this route is at present not utilized by any good road, though it involves practically no climbing, and is partly used by the Athens-Thessaloníki railway. The absence of a good road is mainly because the shore of the Gulf of Thérmai north of the Piniós mouth is smooth and inhospitable, and settlements are few, while further north are the swampy and uninhabited deltas of the Aliákmon and the Axiós. The one-way dry weather road along this route from Lárisa to Témbi will probably be reconstructed and extended northwards along the coast to Katerini.

The main Athens road continues south from Lárisa to Lamía, crossing the broad corridor between the Óthris mountains to the east and the Píndhos mountains to the west. This low plateau, holding the slimy, green waters of Lake Xiniás, is notched at its southern end by the Foúrka pass (2,790 ft. high, and at times under snow) and is of great strategic importance as the main gateway to southern Greece from the north. From Lamía a two-way all-weather road runs west up the Sperkhiós valley to Karpenísion, though the pass (alt. 4,068 ft.) over which it rises before it reaches the cultivated basin in which Karpenísion stands is usually blocked by snow in winter; the ascent to the pass before Karpenísion is reached is very steep and winding in places. The Athens road is continued south from Lamía to Brállos, and it then runs south-east to Levádhia, Thívai, Elevsís and Athens. From Levádhia a two-way road runs west to Ámfissa, Návpaktos, Mesolóngion and Agrínion. This important link with western Greece is open all the year, though the section between Ámfissa and Návpaktos is liable to landslides in the winter and spring. A road, which is two-way in parts, links

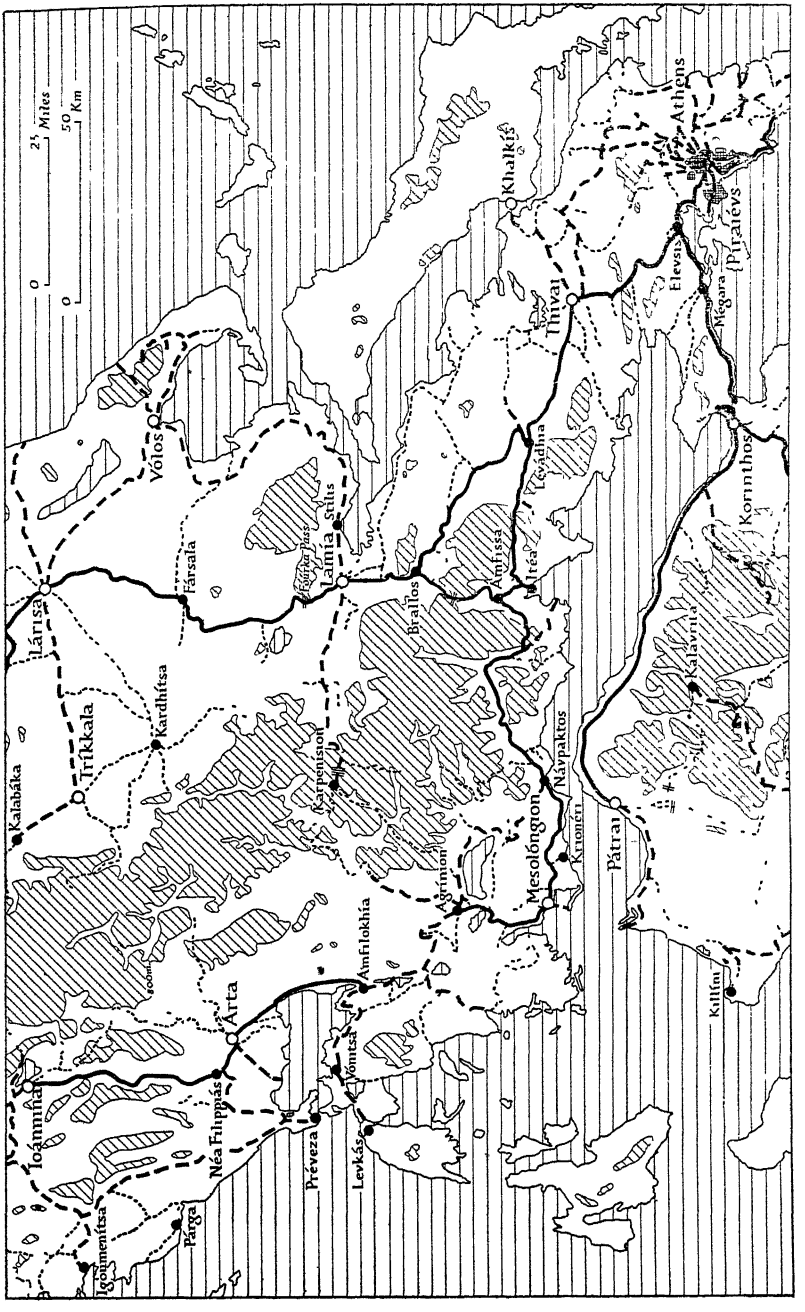


Fig 66 The roads of central Greece
Based on official sources, 1943 For key see Fig 65

Khalkís with the Athens-Thessaloníki road at Thívai. The section between Elevsís and Athens forms part of the main road to the Pelopónnisos, which for most of the way to Kórinthos follows the sea closely and is carried in places on masonry embankments, owing to the steep descent of the mountains to the sea (Plate 98). There are several good metalled roads radiating from Athens to the suburbs and nearby towns and to the port of Piraiévs (Plates 99–102).

(4) *The Roads of the Pelopónnisos* (Fig. 67)

The Pelopónnisos has a greater density of road network than Greece as a whole. Trípolis is the main road focus within the Pelopónnisos, but Kórinthos lies at the exit from the peninsula to central and northern Greece and the main roads from south and west converge upon it. The first major road runs west from Kórinthos to Pátrai, running parallel with the railway and following the narrow coastal plain on the southern shore of the Gulf of Kórinthos The construction of this important road was long delayed as competition with the railway was feared, and until recent years it existed only in stretches Beyond Pátrai, the road deteriorates and no through road exists at present between Pátrai and Pírgos across the rich agricultural plains of Ilía. The second road from Kórinthos runs south-west to Árgos, where it forks to the port of Návplion and to Trípolis and Spárti. A branch road which is mostly suitable for two-way traffic runs south-west to the plain of Messinía and the port of Kalámai. This road passes through the town of Megalópolis, from which a one-way road runs north-west to Pírgos. A number of other roads traverse the mountains between Trípolis and Pírgos, but they are liable to be blocked by snow. On the mountainous sections of the roads crossing the Pelopónnisos, hairpin bends and bottlenecks are not infrequent (Plate 103).

In spite of the fertile agricultural areas which are found in the western Pelopónnisos, the roads of the area are generally poor and in wet weather some of them are impassable There is no road running along the west coast between Pírgos and Kiparissía and although the country is marshy in the vicinity of the Agoulinítsa lagoon and Mouryía lagoon, the route is fairly easy and is followed by the Pelopónnisos railway The most direct road from Pírgos to Kalámai is that running inland to Megalópolis to the south of the Alfiós river. The river is, however, a serious obstacle, for there is no bridge over it south of Pírgos, and vehicles must use a ferry.

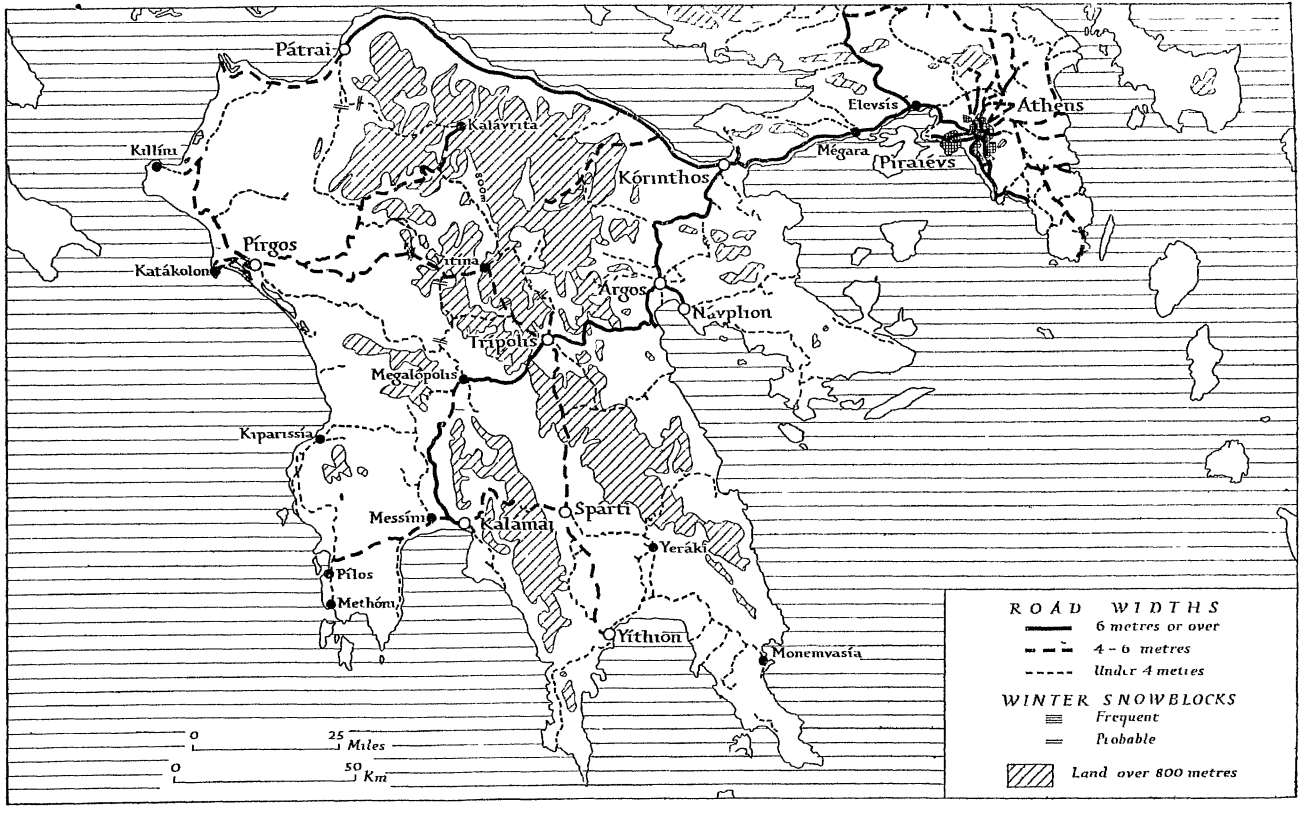


Fig. 67. The roads of the Pelopónnisos
Based on official sources, 1943

(5) *The Roads of the Ionian Islands, the Kikládhes and Eastern Aegean Islands*

There is a greater density of roads in the Ionian islands, both collectively and individually, than in any other part of Greece. Their road network is an inheritance from the British occupation in the nineteenth century. Nevertheless, although there is a considerable mileage of National roads (Fig. 63), they are not in a first-class state of repair (Plate 104). While the Kikládhes are poorly provided with roads, the Aegean islands have close road networks dating from the Turkish occupation.

Bibliographical Note

No full description of the Greek roads has been published in English, but a number of scattered notes and details are available in periodicals such as *Roads and Road Construction* (London, monthly) Some useful information is contained in the *Automobile Association Foreign Touring Guide*, 1939–1940 (London).

A small number of road maps have been published, but they are mostly inaccurate The 1 : 500,000 *Khártis Odhikoú Dhiktíou Elládhos*, a map in six sheets published by the Ministry of Communications in 1936, classifies the roads according to administrative control, i e into National and Departmental or Municipal roads

Chapter X

RAILWAYS

Historical Background Hellenic State Railways Franco-Hellenic Railway Thessalía Railways Peloponnisos Railway · North-Western Railway · Equipment and Operation Traffic Conditions since 1941 · Bibliographical Note

Greece is of all the Balkan countries the least well supplied with railways, with the exception of Albania, which has none at all. There are only about 1,653 miles, representing 1 mile of railway for every 30 sq. miles of territory (cf. Great Britain 4 4 sq. miles, France 5 5, Jugoslavia 13, Bulgaria 19), or 1 mile of railway to 4,261 inhabitants (cf. Great Britain 2,291, France 1,088, Jugoslavia 2,382, Bulgaria 2,855). Similar figures for the Balkan Peninsula as a whole are 1 mile to 19 sq. miles, and 1 mile to 2,877 inhabitants.

The utilization of the lines, moreover, is less intense than in the other countries of the Peninsula—a direct reflection of the comparative poverty of the country in natural resources and of the relatively sparse population. Excluding the Athens-Piraiévs electric railway, which has a service and traffic rather like that of an urban tramway, traffic statistics show that on an average the number of passengers carried annually on the Greek railways is roughly ten millions, representing 6,000 per mile of line—while the annual freight traffic amounts to only about two and a half million tons, representing 1,500 tons per mile of line With these figures may be compared those for Great Britain (60,000 passengers and 13,000 tons per mile of line), Jugoslavia (8,500 passengers and 3,000 tons), and Bulgaria (5,500 passengers and 3,000 tons).

Historical Background

Greece was the last European country to take up railway development. Apart from a short line opened in 1869 there was no construction until 1881, by which time the rail networks of Britain and France, for example, were well established and a large part of Europe lay within easy reach of the iron road. The physical nature of Greece did not attract the railway builder, and the division of the country into small compact regions separated by the sea or by mountain

ranges favoured the growth of small isolated lines rather than a systematic network. Moreover, the country was politically and economically backward, and donkeys and small coasting vessels were adequate for its transport needs.

It was natural that the first railway should be laid between the capital and the chief port. This 5 3 miles line from Athens to Piraiévs was built by an English syndicate in 1867–9. By 1874 it was bankrupt, but its fortunes were revived by a Greek company in 1880. In the 'eighties an underground extension into the heart of the capital at Omónoia (Place de la Concorde) was constructed, and the whole line was electrified in 1904, since when, in spite of the competition of a steam tramway and later of electric trams and motor omnibuses, it has been the most utilized stretch of railway in the whole Balkan Peninsula, with a yearly passenger traffic about double that of all the other Greek lines put together.

The acquisition of the territories of Thessalía and Árta from Turkey in 1881 was the signal for considerable developmental activity. A French public-works mission was employed to plan and make surveys for roads, railways, bridges and harbours, and between 1881 and 1890 concessions were granted for almost all the lines which at present exist, and a period of intensive construction began Within a decade five separate lines, all on the metre gauge, were completed or well in hand The short line from Pírgos to the small port of Katákolon, only 8 miles distant, had as its main purpose the serving of part of the rich agricultural plain of Ilía, the chief currant-producing area of Greece. The Attikí railway connected Athens with the lead-mining centre of Lávrion. The lines in Thessalía, which were designed in the first instance to open up the territory gained from Turkey, and so were subsidized (at £1,290 per mile) by the government, linked the agricultural plain of Thessalía with the small port of Vólos. The North-Western railway connected Krionéri, the small port on the Gulf of Kórinthos opposite Pátrai, with Agrínion, and was built mainly for the transport of agricultural produce, including tobacco. The most important of these early lines, however, was the 'P A.P.'—Piraiévs-Athínai-Pelopónnisos railway—the main line of which ran from Piraiévs through Athens and along the coast, crossing the newly-cut Kórinthos Canal by a bridge, to Pátrai, continuing thence quite close to the west coast of the Pelopónnisos as far as Kiparissía Several branches were given off, as from Pírgos to Olimbía (Olympia) for tourist and agricultural traffic, and to serve the small ports of Kalámai and Návplion. Numerous

other concessions were granted in the Pelopónnisos before the end of the century, but most of them died a natural death in the 'nineties, when the P.A.P., capitalized at £1·2 millions, was in difficulties owing to its large expenditure on construction and the meagre traffic returns from its sparsely populated territory. Only one line was actually started, across the mountainous heart of the peninsula through Trípolis, but it was abandoned in 1891 and was not completed until many years later.

Another line planned by the French engineers in 1883 was to run from Piraiévs through Athens and Thívai to Lárisa. It was hoped that, in contrast with the remaining lines, this might eventually be linked with the European network, and in consequence standard as opposed to metre gauge was recommended. A loan of £3·2 millions was raised and in 1890 an English company began operations, but after two years' work, disagreement between the company and the Greek government led to a stoppage, and a decade elapsed before anything further was done.

Outside Greek territory at the time, though later to be incorporated, were three lines radiating from Thessaloníki (Salonica). The line up the Axiós (Vardar) valley to Skoplje (Uskub) was part of the grand Turkish scheme of 1869, and was completed in the early 'seventies. The other two, both essentially strategic in character, were constructed in the 'nineties. The line to Flórina and Bitolj (Monastir) was built by a German firm in 1890–4, the line to Alexandroúpolis (Dedéagach), known as the J.S.C. (Jonction Salonique-Constantinople), was built by a French company in 1892–5. The latter, designed to provide an all-Turkish route from Thessaloníki to İstanbul (Constantinople), was deliberately laid at least 12 miles from the coast so as to be beyond the range of naval bombardment, and the two ports of Thessaloníki and Alexandroúpolis were provided with by-passes which would allow the railway to function even though the ports were untenable. The link to İstanbul was effected by the Franco-Hellenic line, which was built in the early 'seventies as another part of the Turkish plan of 1869. The section of the railway which makes the link is from Alexandroúpolis to Píthion on the west bank of the Évros (Maritsa) river, where it is joined by the main Orient line from Sofia to İstanbul.

Thus with one important exception, almost all the railways within the present territory of Greece were in existence by 1900. In that year the Hellenic Railway Company was formed to complete the Piraiévs-Lárisa line, and between 1902 and 1909 the Batignolles

Company of Paris performed one of the most notable pieces of railway engineering in Europe, carrying the line over the formidable obstacles of the Oíti and Óthris ranges and across soft and ill-drained plains. The next few years witnessed the extension of the line through the Vale of Témbi (Tempe) to the Turkish frontier at Papapoúli, but there it rested until the frontier was removed as a result of the Balkan Wars of 1912–13. The war of 1914–18 still further delayed the completion of the link with Thessaloníki, but the last rail was laid on the section between Papapoúli and Platí (on the Thessaloníki-Flórina line) in the spring of 1916, and the line played a useful part in the 'Salonica campaign' of 1916–18. It reached its full status as an important international link only in July 1920, when the first Simplon-Orient Express ran through from Paris to Athens.

The treaties which followed the 1914–18 war left Greece in possession of a considerable railway mileage in Makedhonía and Dhitikí Thráki. The three lines radiating from Thessaloníki (to Kreménitsa on the German-owned Bitolj line, to Idhoméni on the Oriental Railway to Skoplje, and to Alexandroúpolis on the J.S C.) were amalgamated with the Hellenic Railway to form the Hellenic State Railways (Sidhirodhromos Ellinikoú Krátous—Σ E.K.), comprising 783 miles of standard-gauge track.

Of the numerous lines, mainly on 600 mm. gauge, which were built by the British army in Makedhonía during the 'Salonica campaign', only one—that from Saraklí to Stavrós, 41 miles—survived and continued to be operated as part of the State Railways. Another wartime line was built by the French in the plain of Karáj Óva, in western Makedhonía. A Décauville line, of 600 mm. gauge, totalling 26 miles in length, ran from Skídhra, on the Thessaloníki-Flórina line, northwards to Ápsalos, whence one branch continued in the same direction to Ardhía and Sosándra, and another forked north-westwards to Megaplátanon. It continued to operate after the war, and in 1925 was sold to a company under the title Local Railway of Makedhonía (Chemins de fer vicinaux de Macédoine). Its traffic was meagre—about 30,000 passengers and 5,000 tons of freight a year—and after ten years it finally ceased to function in 1935.

There has been practically no railway building in Greece during the last twenty years, the only significant additions being a westward extension of the Hellenic Electric Railway from Piraiévs to Pérama, opposite the naval base of Salamís, opened in 1937, and a short branch line from Mirini, on the Alexandroúpolis line, to the new port of Amfípolis at the mouth of the Strimón (Struma) river, completed

in 1940. A standard-gauge line between Véroia, on the Bitolj line, and the Thessalía railway terminus at Kalabáka, has been under construction by a Belgian firm for some years, but has not progressed beyond the stage of preliminary earthworks. Another standard-gauge line in course of construction in 1940 runs north-eastwards from Thessaloníki to Toúmba, near the end of the Saraklí-Stavrós narrow-gauge line, which it was proposed to reconstruct on standard gauge, and continues beyond Stavrós along the shore of the Gulf of Strimón to the mouth of the Strimón river at Iraklítsa opposite Amfípolis. The work was estimated to take two years to complete. Apart from new or projected construction, the only other noteworthy development was the electrification in 1935 of a section of the Attikí railway between the Attikí station in Athens and the residential town of Kifisiá, 7 miles distant. The remainder of the Attikí railway, the Athens-Lávrion line, was taken over by the P.A.P. in 1930.

The growth of road transport during the last two decades has confronted the Greek railways with the problem of maintaining their traffic. The State railways have suffered least in this respect, for much of their passenger traffic travels for long distances, and the freight consists of bulky goods; in both cases, therefore, traffic is somewhat unsuited to the poor roads which are still characteristic of large parts of the country (see Chapter IX). Moreover, omnibus feeder services were established at many stations a few years ago, and this, combined with the general recovery from the economic depression of 1931–3 produced a notable increase in the traffic receipts, which in 1937–8 were almost double those of 1932–3; a net loss of 47 million drachmae in 1932–3 was transformed into a handsome profit of 38 millions in 1937–8. The P.A.P., however, never very sound financially, was adversely affected. This railway, because of its almost entirely coastal location, has been encountering severe competition from coastwise shipping throughout its existence. In an attempt to regain traffic it improved its passenger services by the introduction in the middle 'thirties of Diesel railcars which, for example, cut nearly 4 hr. off the 9 hr. journey from Piraiévs to Pátrai. Nevertheless, it finally succumbed, went into liquidation, and in 1940 its operation was taken over by the State railway administration,

The table on p. 340 lists the various railways, with their main lines and branches, which make up the railway system of Greece (Figs. 68 and 73).

Company	Line	Length miles	Gauge	
			mm	ft in
Hellenic State Railways 838 miles (1,348 km)	Piraiévs-Platí	299	1,435	4 8½
	Oinóï-Khalkís	14	1,435	4 8½
	Lianokládhion-Stilís	14	1,435	4 8½
	Thessaloníki-Kreménitsa and Flórina	133	1,435	4 8½
	Thessaloníki-Idhoméni	48	1,435	4 8½
	Thessaloníki-Alexandroúpolis	276	1,435	4 8½
	Miríni-Amfípolis	12	1,435	4 8½
	Saraklí-Stavrós	41	600	1 11⅝
Franco-Hellenic Railway 115 miles (185 km.)	Alexandroúpolis-Svilengrad	109*	1,435	4 8½
Thessalía Railways 144 miles (231 km)	Velestínon-Kalabáka	88	1,000	3 3⅜
	Vólos-Lárisa	37	1,000	3 3⅜
	Vólos-Miléai	18	600	1 11⅝
Piraiévs-Athínai-Peloponnisos Railway 490 miles (789 km)	Piraiévs-Pátrai	143	1,000	3 3⅜
	Dhiakoftó-Kalávrita	14	750	2 5½
	Pátrai-Zevgolatió	114	1,000	3 3⅜
	Kavásila-Killíni and Loutrá	14	1,000	3 3⅜
	Alfiós-Olimbía	6	1,000	3 3⅜
	Kaló Neró-Kiparissía	4	1,000	3 3⅜
	Kórinthos-Kalámai	147	1,000	3 3⅜
	Árgos-Návplion	7	1,000	3 3⅜
	Biláli-Megalópolis	3	1,000	3 3⅜
	Asprókhoma-Messíni	3	1,000	3 3⅜
	Iráklion-Lávrion	36	1,000	3 3⅜
(Attikí Railway) 9 miles (14 km)	Athens-Kifisiá	9†	1,000	3 3⅜
Pírgos-Katákolon Railway 8 miles (13 km)	Pírgos-Katákolon	8	1,000	3 3⅜
North-Western Railway 44 miles (71 km.)	Krionéri-Agrínion	38	1,000	3 3⅜
	Aitolikón-Katokhí	6	1,000	3 3⅜
Hellenic Electric Railway 12 miles (20 km.)	Piraiévs-Athens	6†	1,435	4 8½
	Piraiévs-Pérama	6†	1,435	4 8½

* Greek section only; the remaining 6 miles are in Turkey and Bulgaria
† Electric traction.

Hellenic State Railways

The State Railways comprise four standard-gauge lines and the isolated narrow-gauge line from Saraklí to Stavrós. For administrative purposes the system is divided into two divisions, a metropolitan division or *direction générale* with headquarters in Athens, comprising the Piraiévs-Platí line and its branches to Khalkís and Stilís, and a provincial division or *direction d'arrondissement* with headquarters in Thessaloníki, comprising the lines radiating from that city to Kreménitsa, Idhoméni and Alexandroúpolis.

Fig 68. The Hellenic State Railways and their connexions
Based on official sources, 1941.
The map shows the location of locomotive servicing facilities.

(1) *Piraiévs-Platí* (Fig. 69, Plates 105–9)

Technical Summary

1. Gauge 1,435 mm (4 ft. 8½ in)
2. Length 482 km. (299 miles).
3. Track single.
4. Maximum permissible axle-load 18 m tons
5. Maximum gradient 20 °/₀₀ (1 in 50)
6. Curvature: minimum radius 300 m (984 ft)
7. Capacity Piraiévs-Lárisa, 18 trains (of 70 axles) each way per day, Lárisa-Platí, 18 trains (of 100 axles)
8. Journey time (1939) 10 hr. 45 min by Orient Express, 14 hr. 10 min. by slow passenger train
9. Engine sheds (Fig 68): Piraiévs (Áyios Ioánnis), Oinóï, Levádhia, Amfíklia, Lianokládhion, Dhomokós, Lárisa, Katerini, Platí

Piraiévs is the terminus of one of the branches of the Orient Express route, and besides being the principal port of Greece it is

also the nearest European port to Egypt. This line of railway, sometimes referred to as the 'Greek longitudinal' because of its general north-south direction, is thus an international and intercontinental railway. Yet it is steeply graded and tortuous, speeds along it are slow, and as there is but one track its traffic capacity is not great.

From Piraiévs harbour the line strikes north-eastwards across the Attikí plain through Athens, ascending steeply at 1 : 62 to cross the col, 1,150 ft. above sea level, which separates the heights of Párnis from those of Pendelikón, and thus to breast the first of the three great east-west ranges which hinder its northward progress. After descending, again at 1 : 62, to the valley of the Asopós river, the line rises over the broad hill mass which stretches from the Parnassós-Párnis range towards the island of Évvoia. At Oinóï it sends a branch northwards, which descends steeply at 1 : 50 to the shores of the Evrípos channel opposite Khalkís. Descending westwards to Thívai, the main line then traverses for some 30 miles the plains of Voiotía, in the centre of which lies the now drained Lake Kopaís. Then comes the second great ascent. Following the Kifissós valley at the northern foot of Parnassós it rises at 1 : 62 to Amfíklia, pauses slightly in its ascent while crossing the valley, and then, bending northwards, makes straight for the col which joins Oíti mountain and the Kallídhromon range. The gradient is 1 : 50 up to Brállos tunnel (over 1 mile long and 1,300 ft. above sea level) by which the Kifissós-Sperkhiós watershed is crossed. From the station of Graviá, just before the tunnel, a road leads southwards across the mountains to the port of Itéa and Dhelfoí (Delphi), and this rail and road route from Athens is quicker than the sea journey from Piraiévs to Itéa. From Brállos tunnel there is a steep and winding descent of the Asopós gorge, with many tunnels through the limestone, and some spectacular viaducts, to the plain of the Sperkhiós river. From Lianokládhion on the floor of this plain a branch runs eastwards through Lamía to the shores of the Maliaic Gulf at Stilís.

From the Sperkhiós plain the line embarks immediately on its third and greatest climb in order to cross the broad Óthris range The ascent is steep (again 1 . 50) and sinuous, with sharp curves and an almost endless succession of tunnels, cuttings, bridges and viaducts. Just beyond the summit, which is 1,920 ft. above sea level, the line skirts the western shores of Lake Xinías—one of those curious upland lake basins which are of such frequent occurrence in the Balkan Peninsula—and then steeply and obliquely descends the northern flanks of the mountains to the level plain of Thessalía. For

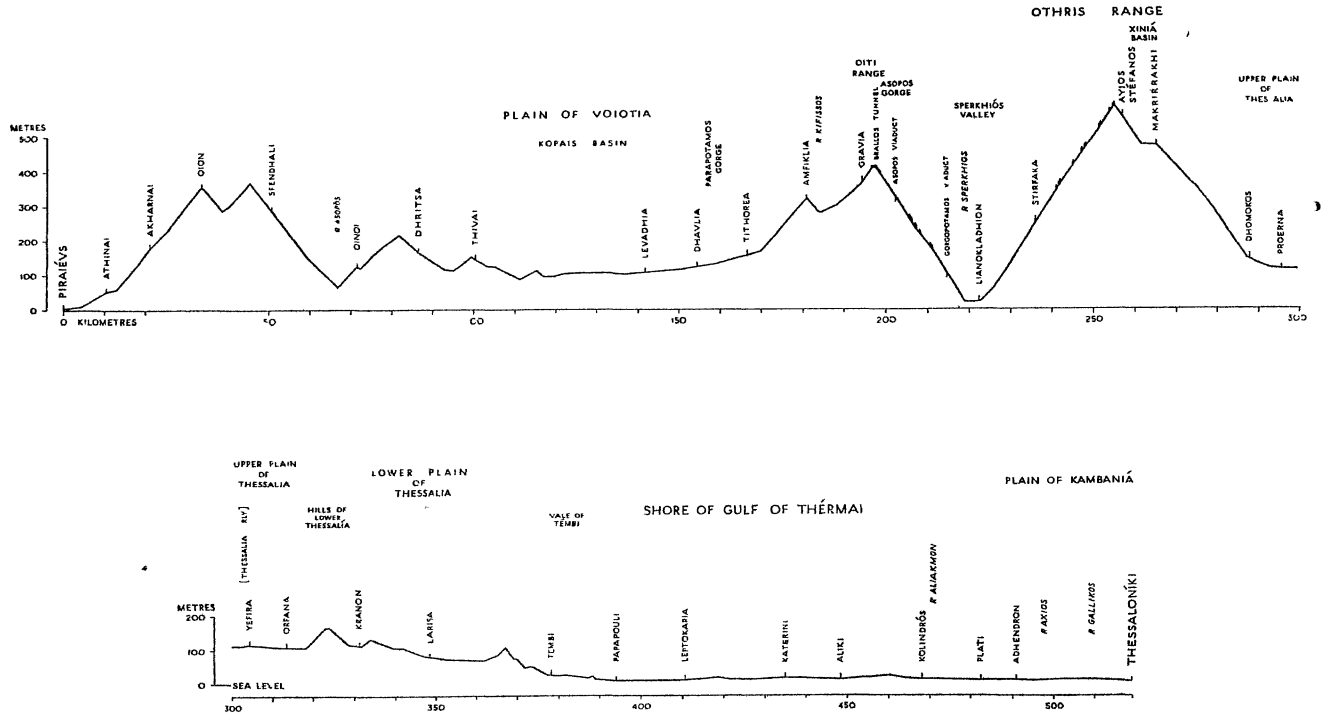


Fig 69 Gradient profile: Piraiévs—Thessaloníki, Hellenic State Railways

The profiles in this series (Figs 70–2, 74, 75) are all on the same scale. The vertical exaggeration in each case is about 85 times

The projections on either side of the Sperkhiós valley represent tunnels

19 miles the track is dead straight across the plain, level or on a gently falling gradient; at Yéfira Palaiofarsálou it crosses the metre-gauge Thessalía line at right angles, and a short spur connects the two lines At Orfaná it turns north-eastwards across the higher ground which separates the Lárisa basin from that of Trikkala, rising on a gradient no steeper than 1 : 91 and descending generally more gently to Lárisa. From Lárisa the Thessalía branch line runs south-eastwards to the port of Vólos, but the two stations in Lárisa are separate and the lines are not connected.

Proceeding northwards the main line follows the plain of the Piniós river for a while, then takes a more direct course than the meandering river, striking it again at the head of the famous gorge known as the Vale of Témbi, which lies between the great mountains of Ólimbos and Óssa. Rail and river run together through the gorge, the railway on a falling gradient of 1 : 100, to emerge on the shore of the Gulf of Thérmai. Past Papapoúli, the old Turkish frontier station, the line closely follows the sea shore for 19 miles, then strikes inland to Katerini to avoid the extensive dune and salt-pan areas, hugging the shore again from Alikí to Methóni. It now turns inland again along the edge of the deltaic flats of the Aliákmon river until a convenient bridging point is found, and then, crossing the river, strikes due north to join the Thessaloníki-Bitolj line at Platí, in the middle of the plain of Kambánia.

(ii) *Thessaloníki-Kreménitsa-(Bitolj)* (Fig. 70).

Technical Summary

1. Gauge: 1,435 mm. (4 ft. 8½ in.)
2. Length 204 km. (127 miles).
3. Track: single.
4. Maximum permissible axle-load: Thessaloníki-Platí, 18 m tons, Platí-Kreménitsa, 14 m. tons
5. Maximum gradient: 25 °/₀₀ (1 in 40)
6. Curvature minimum radius 275 m. (902 ft)
7. Capacity Thessaloníki-Skídhra, 18 trains (of 100 axles) each way per day; Skídhra-Kreménitsa, 10 trains (of 70 axles)
8. Journey time (1939)· Thessaloníki-Flórina, 5 hr. 10 min by express, 7 hr by slow passenger train, Armenokhórion-Kreménitsa, 1 hr. by slow train
9. Engine sheds (Fig 68) Thessaloníki, Platí, Véroia, Skídhra, Édhessa, Amíndaion, Flórina

All three lines from Thessaloníki now use the same station, the one built for the Orient line; the J.S.C. station, which lay about 1 mile to the north-west, has been closed, as its facilities for turning and servicing locomotives were inferior.

The Flórina line, as it is usually called, runs in a general westerly

direction, and with little or no gradient, for the first 43 miles to Véroia. It crosses the southern part of the plain of Kambánia, on a course sufficiently far inland to avoid the extensive deltaic swamps which fringe the head of the Gulf of Thérmai, and much of the line is built on embankments. It crosses the Gallikós river on a large bridge, and shortly afterwards traverses the river Axiós (Vardar) and its new artificial channel on even more imposing structures, the Axiós bridge having seventeen spans with a total length of 2,067 ft. Just before the latter there is a loop to the Skoplje line, which enables

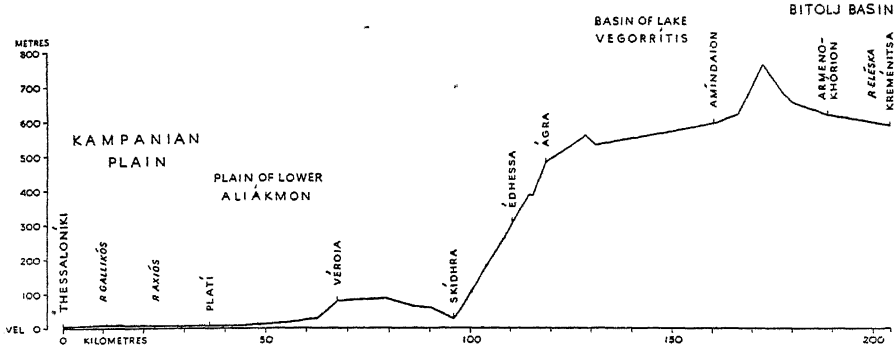


Fig. 70. Gradient profile, 'Florina' line: Thessaloníki—Kreménitsa, Hellenic State Railways

traffic to pass from the Athens line to the Skoplje line without entering Thessaloníki. Passing through the junction of Platí, a gentle climb begins at Yidhá, 27 miles from Thessaloníki, and at Véroia the line turns northwards along the western edge of the plain to Skídhra. Thenceforward the line becomes mountainous, as it swings westwards to ascend and cross the north-south ranges of northern Greece; gradients as steep as 1 : 40 are frequent. The slopes of the Vódas valley are ascended, through Édhessa, and the steep gradients and sharp curves, with numerous tunnels and viaducts, makes this the most impressive, if the most difficult, section of the line. The summit is reached at 1,930 ft. above sea level; just beyond it the line encounters the highland basin of Lake Vegorrítis (Ostrovo), running round the northern end of the lake on an embankment which has had to be realined several times because of fluctuations in the water level. From Lake Vegorrítis the line turns south-westwards across the plain of Lake Petrón, and then turns sharply northwards, rising at 1 : 40 to cross the Kirlí Dervén, a pass 2,525 ft. above sea level,

which leads down to the southern end of the Bitolj (Monastir) basin. Turning westwards at the northern foot of the pass, the line sends a 3 miles branch to Flórina from Armenokhórion and then turns northwards, crossing the Jugoslav frontier 129 miles from Thessaloníki and reaching Bitolj about 11 miles beyond.

(iii) *Thessaloníki-Idhoméni-(Beograd)*

Technical Summary

1. Gauge. 1,435 mm. (4 ft 8½ in.).
2. Length 77 km (48 miles)
3. Track single
4. Maximum permissible axle-load. 18 m tons.
5. Maximum gradient· 11 °/₀₀ (1 in 91)
6. Curvature· minimum radius 259 m. (850 ft).
7. Capacity. 12 trains (of 70 axles) each way per day.
8. Journey time (1939)· 1 hr. 35 min by Orient Express, 1 hr 45 min by slow passenger train
9. Engine sheds (Fig 68): Thessaloníki, Políkastron, Djevdelija (in Jugoslavia)

This line carried its first 'Orient Express' in 1888, and there was a possibility at that time that Thessaloníki might have become an important port on a new and quick route from Europe to the Far East via the Suez Canal; such a development, however, never took place

The line leaves Thessaloníki in a north-westerly direction and runs parallel to the Alexandroúpolis line until the Gallikós river is reached, when the former crosses the river on a large twenty-span bridge and the latter turns north Continuing across the marshy plain on a gently rising gradient of about 1 . 200, the line turns northwards on reaching the Axiós river—and continues to follow the river for over 125 miles, in fact the whole way to Skoplje. Between Áspros and Limnótopos it runs for 6 miles along the western edge of alluvial flats reclaimed from Lake Amátovon, and then, after crossing the Axiós on a large bridge, winds with the river through the Tsingan gorge, 5 miles in length, with some sharp curves and a rising gradient between 1 : 200 and 1 : 125. Just beyond the gorge is the Greek frontier station of Idhoméni, and 2 miles farther on the Jugoslav station of Djevdelija.

(iv) *Thessaloníki-Alexandroúpolis* (Fig. 71)

Technical Summary

1. Gauge. 1,435 mm (4 ft. 8½ in.)
2. Length· 445 km. (276 miles)
3. Track. single.
4. Maximum permissible axle-load 14 m tons
5. Maximum gradient. 25 °/₀₀ (1 in 40).
6. Curvature. minimum radius 300 m (984 ft.).

7 Capacity Thessaloníki-Komotiní, 18 trains (of 70 axles) each way per day; Komotiní-Alexandroúpolis, 10 trains (of 70 axles)
8 Journey time (1939) 10 hr. 35 min eastbound, 11 hr. 22 min. westbound, by express, 16 hours each way by slow passenger train.
9 Engine sheds (Fig 68) Thessaloníki, Sérrai, Dráma, Paranéstion, Xánthi, Komotiní, Mésti, Alexandroúpolis

This line, starting and finishing at sea level, rises four times to elevations of between 650 and 1,000 ft. as it crosses ridges of high ground between the basins of Thessaloníki, Doïráni, Sérrai-Dráma, Xánthi-Komotiní and Alexandroúpolis. After running parallel to the Idhoméni line for 5 miles it turns northwards to follow the Gallikós river, which it crosses at mile 12. Leaving the river at mile 21 it ascends at 1 : 71 to Kilkís, just over 650 ft. above sea level, and descends at 1 : 66 to the Agák valley at Kalíndria, whence the strategic loop, now abandoned, formerly ran south-westwards to join the Idhoméni line at Políkastron, thus creating an east-west route by-passing Thessaloníki. The Agák valley is then followed to its head, and crossing a low col the line arrives on the south-western shore of Lake Doirání, only ½ mile from the Jugoslav frontier. The line follows the lake shore, crosses the marshy eastern end of the basin and then ascends sharply to the Dová Tepé col, 886 ft., descending even more steeply, at 1 : 50, to the broad flat plain of the Strimón river, skirting the northern shores of Lake Kerkíni before crossing the Strimón by a large bridge at the southern end of the Klidhí (Rúpel) gorge by which that river cuts through the Kerkíni Béles (Belashitsa mountains) from Bulgaria. After crossing the river the line turns south-eastwards to Sérrai, beyond which town, after a slight rise, it descends to the flat plain of the Strimón, covered until its recent draining by Lake Akhinoú. At Miríni a short branch line runs southwards to the new port of Amfípolis at the mouth of the Strimón river. The main line, bending north-eastwards, ascends the Angítis valley on a gradient which steepens to 1 · 66, and crossing a col, descends a rocky gorge to the plain of Dráma.

Thenceforward, economic circumstances would seem to dictate a south-eastward course to the port of Kaválla, but instead, in order to avoid approaching the sea coast, the line turns inland, rising steeply with gradients as heavy as 1 : 40, to a col 1,056 ft. above sea level which separates the drainage of the Dráma basin from that of the Néstos (Mesta) river. Beyond the summit there is a steep descent, again at 1 : 40, and after crossing the Néstos river the line continues to follow its deep-cut valley, with numerous tunnels in the impressive Korpillón gorge between mile 185 and 194. Here the gorge ends

suddenly and the river continues across a deltaic plain to the sea, while the railway turns north-eastwards to Xánthi. From Xánthi to Komotiní the line runs due east at the foot of the steep edge of the Rodhópi mountains, the track is undulating but gradients are easier, with nothing steeper than 1 : 83. Beyond Komotiní the general direction becomes south-easterly, and after dropping to the Filiourí valley at Vénna the line begins its fourth major ascent, following the Mikró valley at 1 : 40 to a summit 912 ft. above sea level, and then descending the narrow and sinuous Irén valley at 1 : 40 to Potamós, where the gorge ends. It was at this point that the now abandoned strategic loop by-passing Alexandroúpolis diverged eastwards to join the Franco-Hellenic line at Férrai. From Potamós the line runs more gently southwards across the broadening plain to Alexandroúpolis. At the military station, ½ mile from the town terminus, a loop connects with the Franco-Hellenic line, thus permitting the working of through freight traffic to Bulgaria and Turkey.

(v) *Saraklí-Stavrós*

Technical Summary

1. Gauge 600 mm (1 ft 11⅝ in.)
2. Length 66 km (41 miles)
3. Track single
4. Maximum permissible axle-load ?
5. Maximum gradient 20 8 °/₀₀ (1 in 48)
6. Curvature · minimum radius 85 m (279 ft)
7. Capacity · 2 trains each way per day
8. Journey time (1939) · 3 hr 30 min
9. Engine sheds. Saraklí, Stavrós.

Built between October 1917 and April 1918 to facilitate military transport inland from the small port of Stavrós and so relieve congestion at Thessaloníki, this line ended its war career by being mainly used for traffic in the reverse direction. The reason for this was that Stavrós became dangerous owing to the activities of submarines, and supplies for western Thrace (Thráki) had to be imported at the now enlarged port of Thessaloníki. It was connected by a standard-gauge line from Saraklí to Salamanlí (now called Gallikós) on the 'Salonica-Dedéagach' line, the demolition of this connexion after the war left the narrow-gauge line isolated, and its traffic has since been meagre and its equipment has gradually fallen into decay. The line takes advantage of the elongated depression which contains the two lakes Korónia and Vólvi (Besikíon); it runs along the southern shore of each of these, and ends by following the outlet of the latter—the gorge of the Ríkhios river—down to the sea at Stavrós.

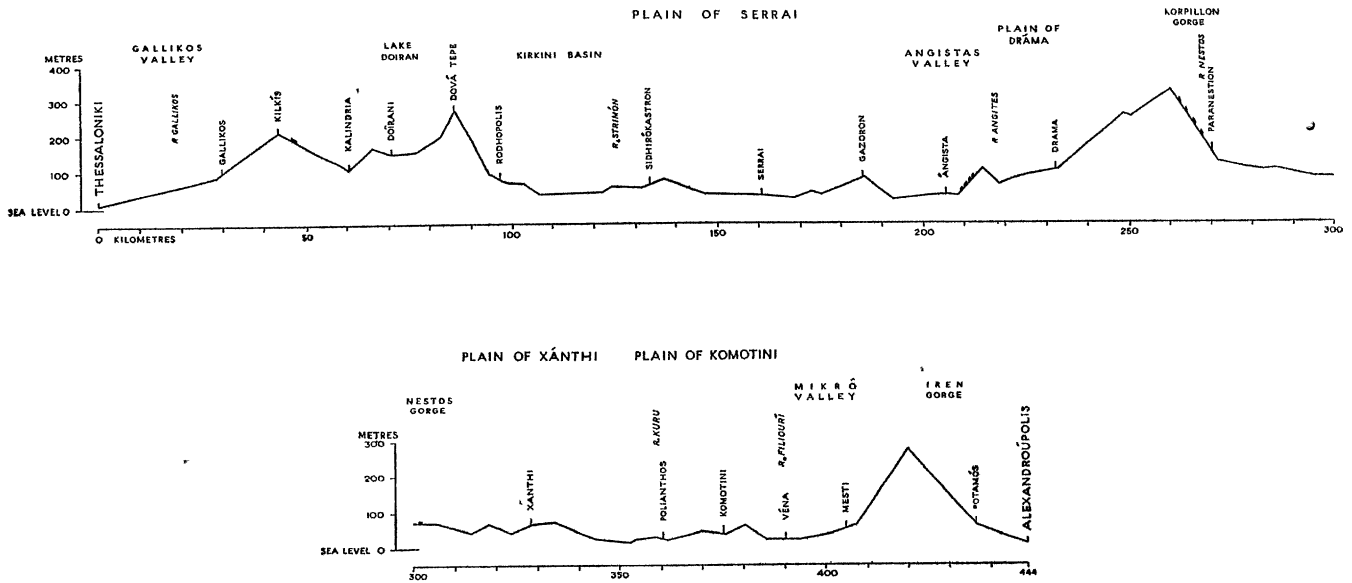


Fig 71. Gradient profile. Thessaloníki—Alexandroúpolis, Hellenic State Railways
The projections between Kilkís and Xánthi represent tunnels.

Franco-Hellenic Railway

Technical Summary

1 Gauge 1,435 mm (4 ft. 8½ in.)
2 Length 185 km (115 miles)
3 Track: single
4 Maximum permissible axle load 14 m tons
5. Maximum gradient 16 °/₀₀ (1 in 62)
6 Curvature: minimum radius 300 m (984 ft.)
7. Capacity 8 trains (of 70 axles) each way per day
8 Journey time (1939) Alexandroúpolis-Pithion, 2 hr 9 min by express, 2 hr 18 min by railcar; Pithion-Svilengrad, 1 hr 40 min by Orient Express, 2 hr 30 min by slow passenger train
9 Engine sheds, etc (Fig 68) Alexandroúpolis, Pithion, Karaagách, near Edirne (Adrianopolis) in Turkey, Svilengrad, in Bulgaria

This company has its headquarters in Paris, but is administered from offices in Alexandroúpolis. Not all of its line is within Greek territory, for it runs through the western extremity of European Turkey for 4 miles, and the last 3 miles into Svilengrad lie within the frontiers of Bulgaria.

The Alexandroúpolis terminus lies about ½ mile east of the town centre, and is connected by a loop line with the State Railways line to Thessaloníki. For the first 16 miles the line runs eastwards along the northern edge of the deltaic flats of the Évros (Maritsa) river; it then bends north-eastwards through Férrai and follows the general direction of the Évros at an average distance of 2 miles from the meandering river (which forms the Graeco-Turkish frontier). Through Péplos (25 miles) there is a short rise and fall over a hill spur which projects into the Évros plain, and at Laïná (36 miles) the direction changes to northerly and the line draws closer to the river. At Lávara (52 miles) a north-easterly direction is resumed and the line hugs the edge of the narrowing and more confined plain about 1 mile from the river. At about mile 68 it swings northwards, quite close to the river, and encounters the Turkish line from İstanbul which has just crossed the Évros on a large bridge, the two lines run parallel into Pithion station.

From Pithion to Edirne the general direction is north-north-west to north, and the line keeps to the western edge of the flat river plain, here about 3–4 miles wide, through Néa Orestiás. Between mile 89 and 93 it passes through Turkish territory, and in the middle of this stretch is the station of Karaàgách, from which a short branch runs to the city of Edirne (Adrianopolis) which lies on the opposite side of the Évros. Re-entering Greek territory by crossing the

Árdhas (Arda) river on a large bridge, the line follows the Évros fairly closely in a north-westerly direction across the Bulgarian frontier (mile 112) to Svilengrad. Between Píthion and Svilengrad the Franco-Hellenic line forms part of the main Orient Express route from western and central Europe to İstanbul.

Thessalía Railways

The Thessalía Railways comprise three lines. Two metre-gauge lines link the two plains of Thessalía with the port of Vólos, and a 60 cm. line, formerly known as the Pílion Railway, runs along the southern flanks of Pílion mountain from Vólos to Miléai.

(i) *Vólos-Lárisa*

Technical Summary

1. Gauge 1,000 mm (3 ft 3⅜ in.)
2. Length. 61 km (37 miles).
3. Track single.
4. Maximum permissible axle load ?
5. Maximum gradient 20·8 °/₀₀ (1 in 48)
6. Curvature minimum radius 180 m (591 ft)
7. Capacity Vólos-Velestínon, 14 trains each way per day, Velestínon-Lárisa, 12 trains.
8. Journey time (1939) 1 hr 45 min
9. Engine sheds (Fig 68) Vólos, Velestínon, Lárisa

After crossing the small plain at the head of the Gulf of Vólos for 2 miles, the line rises steeply, with a maximum gradient of 1 : 48, to attain the Piláftepe pass (altitude 450 ft) in the range of hills which separate the Gulf from the lower plain of Thessalía. An almost equally steep descent follows to Velestínon, at which point the Kalabáka line diverges. For the remaining 25 miles to Lárisa the line runs in a general north-westerly direction across the plain, with few gradients steeper than 1 : 250.

(ii) *Velestínon-Kalabáka* (Fig. 72)

Technical Summary

1. Gauge 1,000 mm (3 ft 3⅜ in)
2. Length 141 km (88 miles)
3. Track single
4. Maximum permissible axle-load ?
5. Maximum gradient 30 3 °/₀₀ (1 in 33).
6. Curvature minimum radius 150 m (492 ft)
7. Capacity 12 trains (of 36 axles) each way per day
8. Journey time (1939) 5 hr
9. Engine sheds (Fig 68). Velestínon, Kardhítsa, Kalabáka

This line curves back sharply from its junction with the Lárisa line near Velestínon, and climbs steeply southwards at 1 : 33 to a summit 750 ft. above sea level in the Mavrovoúni range. Descending at 1 : 48 to Aèrinón, it curves sharply westwards at mile 6, and rises at 1 . 77 to another summit (800 ft.) before descending at 1 : 66 to the valley of the Enipévs river, where the steeply graded section ends. The river is followed, first on its northern, and then, beyond mile 26, on its southern side, for some 12 miles, until the valley merges into the broad plain of western Thessalía. Passing some 2 miles north of the town of Fársala, the line continues westwards, receiving a spur

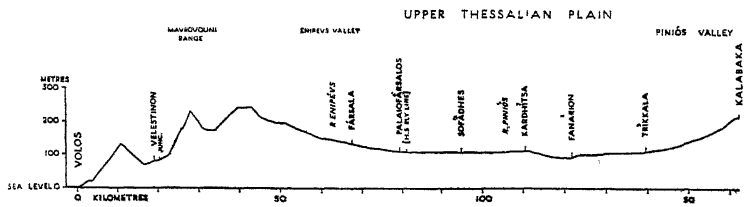


Fig. 72. Gradient profile: Vólos—Kalabáka, Thessalía Railway

from the State Railways Athens-Lárisa line at Palaiofársalos and passing under that line shortly afterwards.

From here to Tríkkala the line is almost level, and lies at roughly 330 ft. above sea level. There are over eighty bridges across the very numerous watercourses which seam the surface of the plain, the largest being those across the Farsalítis (at mile 39), Vrénikos (mile 45), Pámisos (mile 67), Piniós (mile 71), Koumérkis (mile 72), and Ayía Moní (mile 73). At Kardhítsa (mile 56) the line takes on a north-westerly direction which is maintained to Kalabáka. From Tríkkala to Kalabáka the railway follows the broad but gradually narrowing valley of the Pinios river, which forms a north-westerly extension of the plain of Thessalía. The gradient steepens towards the end, reaching a maximum of 1 : 83. There are more bridges over tributary torrents and a large one at mile 83 over an old branch of the Piniós, for the last 12 miles to Kalabáka the line runs for the most part on an embankment.

(iii) *Vólos-Miléai* (Plate 110)

Technical Summary

1. Gauge · 600 mm (1 ft. $11\frac{5}{8}$ in)
2. Length 29 km. (18 miles).
3. Track: single
4. Maximum permissible axle-load ?

5 Maximum gradient 30 3 °/₀₀ (1 in 33)
6 Curvature minimum radius 40 m (131 ft)
7 Capacity 8 trains each way per day
8. Journey time 2 hr
9 Engine sheds Volos, Miléai

From a small station adjacent to that of the metre-gauge line, this railway—sometimes referred to as a 'steam-tramway'—runs south-eastwards through the town, and thence along the sea shore as far as Agriá (5 miles). Proceeding and rising slightly over the narrow coastal plain to Áno Lekhónia, it then begins to climb the lowest and outermost slopes of Pílion mountain, sinuously following the numerous spurs, and crossing by viaducts, the longest of which is 185 ft., a number of deep torrents which seam the mountain side. The maximum gradient is 1 . 33. The station at Miléai, 930 ft. above sea level, lies in the valley bottom below and west of the town.

Pelopónnisos Railway

The P.A P. Railway has as its two termini Piraiévs and Kalámai (Fig. 73). A single trunk line connects Piraiévs with Kórinthos, beyond which there are two routes to Kalámai, the longer but more easily graded following the northern and western coasts of the Pelopónnisos, the shorter cutting across the mountainous heart of the peninsula via Trípolis. Several short branches are given off, some to places in the interior, e.g Megalópolis and Olimbía, but mostly to small ports, e.g. Návplion, Killíni and Kiparissía. In addition, the Attikí Railway, connecting Athens and Lávrion, has formed a part of the P.A.P. system since 1930. As already mentioned, the operation of the P.A.P. was taken over by the State Railways administration in 1940.

(1) *Piraiévs-Kórinthos-Pátrai* (Fig. 74)

Technical Summary

1 Gauge. 1,000 mm (3 ft 3⅜ in)
2 Length 230 km (143 miles)
3 Track single
4 Maximum permissible axle-load: 9½ m. tons
5. Maximum gradient. 25 °/₀₀ (1 in 40)
6. Curvature· minimum radius 110 m (361 ft)
7 Capacity 6 trains each way per day (could be increased to 12 with more rolling stock and considerable organization).
8. Journey time (1939). 5 hr. 15 min by express railcar; 9 hr. 15 min. by slow steam train
9. Engine sheds Piraiévs, Kórinthos, Pátrai.

For the first 7 miles, through Athens, this line runs closely parallel to the State Railways line (Fig. 76), on a rising gradient which reaches a maximum of 1 : 55. The gradient steepens beyond Athens as the railway, swinging westwards through Áno Liósia, climbs at 1 : 44 to the summit of a broad col, 560 ft. above sea level, which joins the

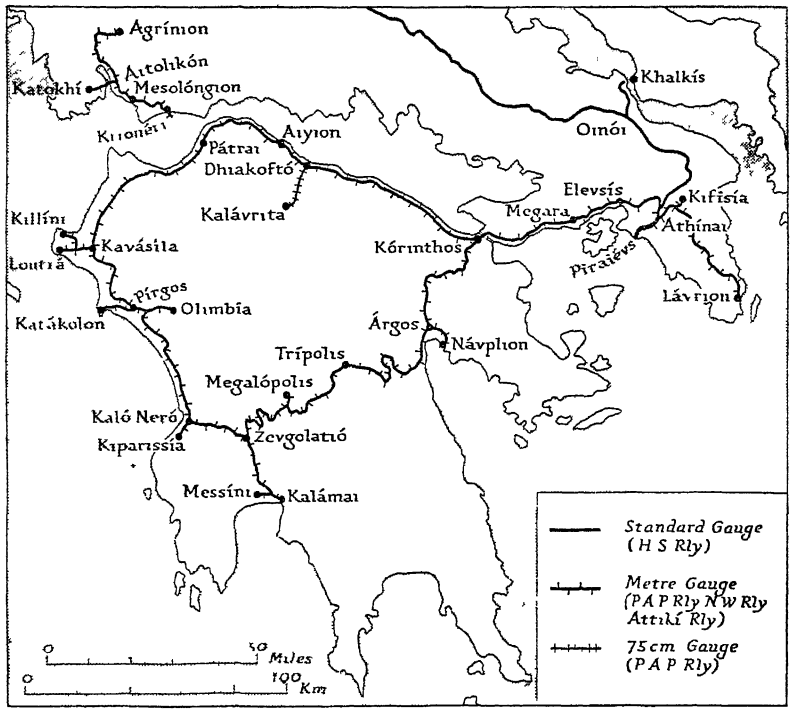


Fig. 73. The railways of southern Greece
Based on official sources, 1941.

hill mass of Aigáleos to that of Párnis. There follows an even steeper descent, at 1 : 40, to the Thriásion plain, and from mile 17 to Elevsís the line runs on the edge of this plain about ½ mile from the shore of Elevsís Bay. For the next 34 miles the line is never far from the sea; it skirts the shore at the foot of steep hills between Elevsís and Néa Péramos, runs slightly farther inland across the small plain of Mégara, and then returns to the steep coastal slope. For 6 miles its course lies along the occasionally almost precipitous face of the Skironian Cliffs (Kakí Skála); there are several sharp curves, bridges over

gulleys, and retaining walls, and the line commands a magnificent view across the Saronic Gulf to the islands of Salamís and Aíyina and the coast of the Pelopónnisos. Paralleled at a lower level down the cliff face by the main Athens-Kórinthos road, the two lines of communication are easy targets from the sea. Beyond Kinéta the coastal slope becomes less steep, and then the line crosses the seaward end of the small plain of Sousáki.

Between Kalamáki and Kórinthos the isthmus of Kórinthos has to be crossed obliquely. A sharp rise at 1 : 40 leads to the summit 305 ft. above sea level; for a short distance the line runs parallel

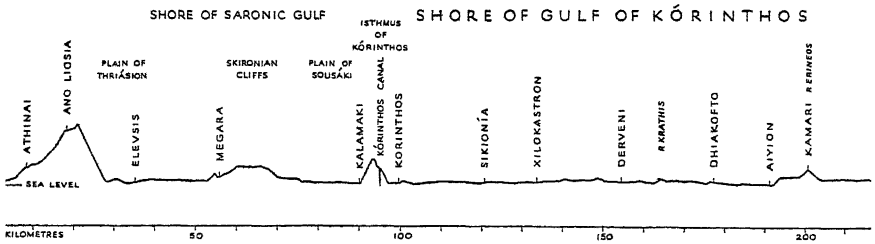


Fig 74. Gradient profile: Piraiévs—Pátrai, P A.P. Railway

with the canal, and then turns sharply to cross it at right angles on a bridge 300 ft. long and 144 ft. above the water level; there follows a steep descent again at 1 : 40 to the shore of the Gulf of Posidhonía, and the line curves westwards to run through the south-eastern part of the town of Kórinthos.

From Kórinthos to Pátrai the line follows the southern shore of the Gulf of Kórinthos; it is easily graded though undulating, and only in one place is there any gradient steeper than 1 : 100. The narrow coastal plain varies in width from a few hundred yards to 2 or 3 miles, and the railway is in general between ½ and 1½ miles from the sea shore. There are numerous bridges across the pebble-strewn beds of the many torrents which, alternately dry and in spate, seam the hillsides and deposit their load of debris over wide areas of the plain; the bridges are thus characterized by length rather than height, and the most notable are those across the Skoupéïkos (mile 93), the Kriós (mile 99), the Kráthis (mile 102) and the Erineós (mile 124). Usually the line rises, sometimes quite sharply, in order to get from the floor of the plain to the level necessary for bridging the streams. At Dhiakoftó (mile 110) a narrow-gauge branch runs southwards into the mountains (see below); a further 8 miles brings

the line to the small port of Aíyion. Then, after crossing the wide stony bed of the Erineós, the line follows the shore behind a belt of sand dunes, and swings south-westwards along the edge of the Gulf of Pátrai to the port of the same name, where it runs through the town along the sea front.

(i (*a*)) *Dhiakoftó-Kalávrita branch* (Plate 111)

Technical Summary

1. Gauge 750 mm (2 ft. 5½ in.).
2. Length: 22 6 km (14 miles)
3. Track: single; 3 miles of rack-and-pinion.
4. Maximum permissible axle-load: ?
5. Maximum gradient 37 5 °/₀₀ (1 in 28) on normal track; 145 °/₀₀ (1 in 6 9) on rack-and-pinion track
6. Curvature: minimum radius 80 m (263 ft.) on rack-and-pinion track, 35 m. (115 ft.) on normal track.
7. Capacity: 4 trains each way per day
8. Journey time (1939): 2 hr. uphill, 1 hr. 40 min. downhill
9. Engine sheds: Dhiakoftó, Kalávrita

This spectacular little line, 14 miles in length, rises almost 2,300 ft. in that short distance. It was very expensive to construct, but has little economic value apart from serving the small tourist centre at its terminus (Kalávrita, 'good springs'). About 3 miles of the route (from mile 5 to Megaspílaion) with a maximum gradient of 1 : 6·9, is worked by the Abt system of rack-and-pinion; on the remainder normal adhesion working is employed but the gradient even on this section reaches 1 : 28 The line follows the wild gorge of the Vouraikós, often clinging to the side of rocky precipices, and there are many viaducts, cuttings and short tunnels; the river itself is crossed half a dozen times.

(ii) *Pátrai-Zevgolatió* (*for Kalámai*)

Technical Summary

1. Gauge: 1,000 mm. (3 ft. 3⅜ in.).
2. Length 184 km (114 miles).
3. Track: single.
4. Maximum permissible axle-load: probably 9 5 m. tons
5. Maximum gradient 22 °/₀₀ (1 in 45), on Pátrai-Kaló Neró section it is only 12 °/₀₀ (1 in 83)
6. Curvature: minimum radius ?
7. Capacity: 6 trains each way per day.
8. Journey time (1939): 8 hr. 15 min.
9. Engine sheds: Pátrai (no further details available).

From Pátrai to Pírgos this line traverses the rich agricultural plains of Akhaía and Ilía; it feeds the ports of Pátrai, Killíni and Katákolon, centres of the currant export trade.

After passing through the streets of Pátrai, it continues for 13 miles along the southern shore of the Gulf to Akhaía, where it bends south-westwards and cuts across the base of the low Pápas peninsula, curving south as it approaches to within about 2½ miles of the dune-fringed shore of the Ionian Sea. At Kavásila (mile 40) a branch runs westwards to Vartholomión, where it forks, the northerly arm continuing to the small port of Killíni, the southern to the hot springs of Loutrá. Just beyond Kavásila the Piniós river is crossed, and the line continues in a general south-easterly direction, roughly following the trend of the shore line, to Pírgos (mile 62). Here it is joined by a line (not actually part of the P.A.P. railway) from the port of Katákolon, 8 miles to the west. This little currant-carrying line runs for part of its course along the dune-fringed sea shore, and its diminutive locomotives are specially protected by weather-boarding against damage to their mechanism by blown sand (Plate 116).

From Pírgos the line continues eastwards to Alfiós. Here a branch line, 9 miles in length, continues in the same direction towards Olimbía; this branch has of course a considerable tourist as well as agricultural traffic. The main line turns abruptly southwards and crosses the broad bed of the Alfiós river on a large six-span bridge, 984 ft. long (Plate 112). Another 6 miles across the coastal plain brings it to the inner shore of the Agoulinítsa lagoon, which it follows for 4 miles; then, after crossing the channel which connects this lagoon with the Kaiáfa lagoon, it resumes its south-easterly course parallel to the coast and maintains a distance of between ½ and 1 mile from the shore of the Gulf of Kiparissía all the way to Kaló Neró (mile 96). Here a branch continues southwards to the small port of Kiparissía. The gradients on this coastal section are greater than might be expected; between Alfiós and Kiparissía the line is undulating at 1 : 100 or 1 : 83. This is probably a result of the inexpensive construction of the line, in which earthworks were reduced to a minimum.

The main line turns sharply eastwards at Kaló Neró to pass through the Kókla Gap, thus crossing the westernmost of the finger-like ranges of the Pelopónnisos and the watershed between the Gulfs of Kiparissía and Messinía. It ascends the northern slopes of the Arkadhéïka valley in a somewhat sinuous course on a gradient of 1 : 45 to a summit 690 ft. above sea level, and then descends the Pírnax valley at 1 : 55 to beyond Áno Vasilikón, after which it leaves the valley and passes through an easy gap in the hills to Zevgolatió, where it joins the Trípolis-Kalámai line.

(iii) *Kórinthos-Kalámai* (Fig. 75; Plate 113)

Technical Summary

1 Gauge 1,000 mm (3 ft. 3⅜ in.)
2. Length 236 km (147 miles)
3 Track single.
4. Maximum permissible axle-load probably 9 5 m tons
5 Maximum gradient 25 °/₀₀ (1 in 40)
6 Curvature: minimum radius · ?
7 Capacity 6 trains each way per day (maximum load for freight trains 20 trucks, i e. 120 tons)
8 Journey time (1939)· 5 hr. 25 min by express railcar, 10 hr. by slow steam train
9 Engine sheds Kórinthos, Míloi, Trípolis, Kalámai (no further details available)

Diverging from the Pátrai line in a south-westerly direction, this route traverses the coastal plain to Examíllia, on a rising gradient steepening to 1 : 42. It then ascends the Lévkon valley, mostly at 1 : 40, to a summit 1,010 ft. above sea level at Khiliomódhion, where it turns sharply westwards, and after a steep descent rises again to a second summit at Neméa (altitude 1,043 ft.). A steep descent (1 · 40) follows for 7 miles; the line turns southwards in a sharp hairpin bend and runs down the Dervéni valley, almost a gorge, to Mikínai (Mycenae), where it emerges on to the northern end of the plain of Argolís The descent continues, more gently, to Árgos From Árgos a 7 miles branch line leads south-eastwards across the plain to the port of Návplion.

The main line turns south-westwards to the head of the Gulf of Argolís at Míloi (mile 40). Thenceforward for 87 miles it has the character of a mountain railway, as it cuts across the ranges and upland plains of Arkadhía Ascending a ravine south of Míloi, the line then curves westwards through Andrítsa and makes a great northward loop through Akhladhókambos in order to get round the head of the valley, which it ultimately crosses on a viaduct 230 ft. high and 827 ft. long. Still climbing steeply, it makes a southward bend round the flanks of Parthénion mountain, and reaches a summit level of 2,460 ft. Beyond this summit there is a relatively level stretch across the upland plain of Teyéa to Trípolis (mile 75, altitude 2,175 ft.), after which the climb is resumed to cross the Kaloyerikón pass (2,625 ft.), the highest point reached. Descending the north-western flanks of Tsimberoú mountain, the line passes through Marmariá, overlooking another upland plain, and then turns sharply north-westwards into the Koutifárina ravine, twisting its way round the northern extremity of the great Taíyetos range to the upper

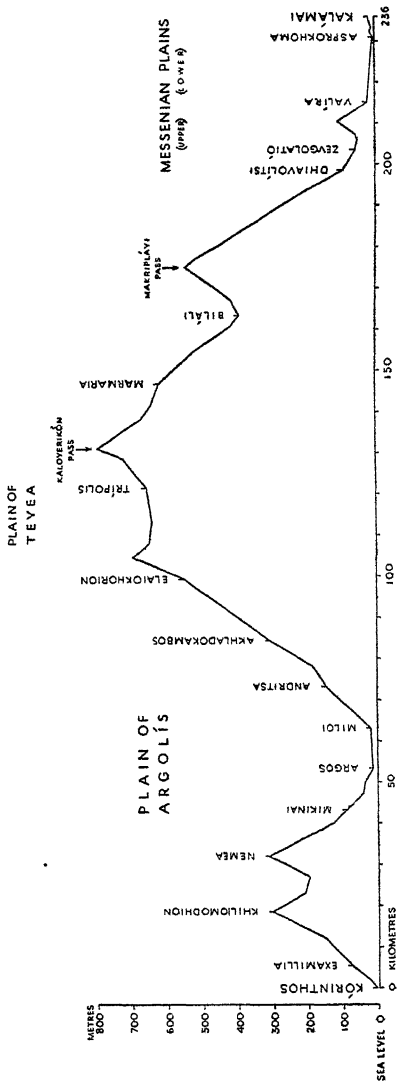


Fig. 75. Gradient profile of the trans-Peloponnisos line Kórinthos—Kalámai, P.A.P. Railway

Alfiós valley, which it follows to Biláli (mile 102), the junction of the short 3 miles branch to Megalópolis. There follows the last climb, to the 1,800 ft. summit of the Makripláyi pass, and then the line descends steeply, with more sharp bends as it crosses the deep valley of a headstream of the Pámisos river and rounds a southward mountain spur, to Dhiavolítsi. On this descent a view to the south presents some of the most striking panoramas in southern Greece; the whole of the plains of Messinía are spread out below, with the mountains of Ithómi rising on their western side. At Dhiavolítsi the line turns abruptly southwards and drops more gently to the upper plain of Messinía at Zevgolatió (mile 127), junction of the Pátrai line. A sharp rise at 1 : 50 followed by a steep drop at 1 : 42 carries the line down to the lower plain of Messinía, which is entered at Valíra. The last 12 miles to Kalámai are more easily graded (maximum 1 : 91); for 5 miles the line parallels the Pamisós river, and then strikes south-eastwards across the edge of the deltaic flats to Asprókhoma and Kalámai. Asprókhoma is the junction of a 3 miles branch running westwards across several delta channels to Messíni.

(iv) *Athens-Lávrion (former Attikí Railway)*

Technical Summary

1. Gauge. 1,000 mm (3 ft $3\frac{3}{8}$ in)
2. Length 64 km (40 miles)
3. Track. single.
4. Maximum permissible axle-load ?
5. Maximum gradient 25 °/₀₀ (1 in 40).
6. Curvature: minimum radius 110 m (360 ft).
7. Capacity 4 trains each way per day.
8. Journey time · no service in 1939.
9. Engine sheds. Athens (Attikí), Lávrion

The Attikí station in Athens is connected by a spur to the P.A.P. Railway; the underground tunnel started some years ago with the object of facilitating through electric traffic from the Hellenic Electric line to Kifisiá has never yet been used, and may not even be complete (Fig. 76).

The Attikí line takes a rising north-easterly course as far as Áno Iráklion, where the electrified line to Kifisiá diverges; thence it runs in a general south-easterly direction through the heart of the Attikí peninsula. Passing first through the gap between the mountains of Pendelikón and Imittós, it descends gently to the central plain of Attikí (the Mesóyia) which is crossed between Liópesi and Markópoulon (mile 22). At Kalívia the line enters the hilly massif of

Lávrion, it keeps to cultivated valleys between barren hills, and attains a level of about 625 ft. at Keratéa (mile 31). At about mile 34 it turns southwards and descends the narrow Potamós valley

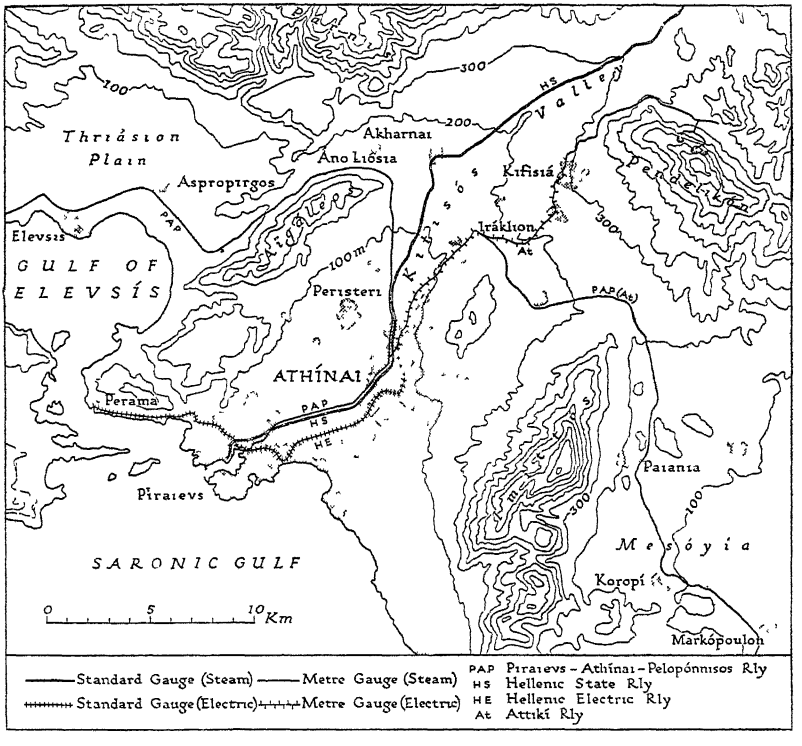


Fig 76. Railways in the neighbourhood of Athens

Based on G S.G.S series 4087, 1.100,000, sheet C4242 (1941) and official sources, 1941.
The built-up areas are stippled and the contour interval is 100 metres. The dots between the northern end of the Hellenic Electric railway and the southern end of the electrified Attikí line represents the underground section, not yet open (see p 360) The metre-gauge railway north-east of Kifisiá serves the 'Ancient Quarries' of Pendelikón The marble from these quarries is very fine grained, brilliant white in colour with a slight yellowish tinge, and is admirably adapted both for building and sculpture; it is the material of the Acropolis and other buildings.

to Thorikón, on Thorikón Bay, then passing through the town of Lávrion to the port on the shore of Lávrion Bay, where it links up with the 'system' of tramways serving the lead and lime works.

North-Western Railway

Technical Summary

1 Gauge 1,000 mm. (3 ft 3⅜ in.).
2 Length 61 km (38 miles)
3 Track: single
4 Maximum permissible axle-load: ?
5. Maximum gradient. 20 °/₀₀ (1 in 50).
6. Curvature minimum radius 120 m. (394 ft.)
7. Capacity 4 trains each way per day
8 Journey time (1939) 2 hr. 40 min.
9 Engine sheds: Krionéri, Mesolóngion, Agrínion.

This little metre-gauge system, comprising the 38 miles Krionéri-Agrínion line and its 6 miles branch from Aitolikón to Katokhí, is quite isolated from the rest of the Greek railways, the only connexion being the steamer service from Krionéri pier across the Gulf of Pátrai.

From Krionéri the line runs north-westwards across the narrow coastal plain, turning westwards and crossing the Évinos river on a long twelve-span bridge (787 ft. in length) to Mesolóngion, where the chief repair depot is situated. Turning north-eastwards again along the shore, it crosses a low marshy plain to Aitolikón junction. Here the Katokhí branch diverges westwards, running along a causeway to the tiny island on which the town of Aitolikón stands between the Mesolóngion and Aitolikón lagoons, and continuing west-south-west to the banks of the Akhelóos river opposite the town of Katokhí. The main line continues along the eastern shore of the Aitolikón lagoon, and after rounding the head of the lagoon to Stamná rises steeply at 1 : 50 across the western end of the Arákinthos range. It then descends to the low-lying floodable stretch of ground by which the river Akhelóös sometimes overflows to Lake Angelókastron. Beyond Kalívia (31 miles from Krionéri) the line turns eastwards, rising gradually across the plain to Agrínion.

Equipment and Operation

Rolling Stock

The table on p. 363 summarizes the rolling stock position on the Greek railways in 1937, since when there has probably been little change.

The stock of locomotives, coaches and wagons was adequate for the meagre traffic with which the lines had to deal, though the P.A.P. railway in particular was none too well provided; in no case,

Railway	Steam locomotives			Rail-cars	Passenger coaches	Goods wagons
	Tender	Tank	Total			
H S R Standard gauge	157	26†	183	2	345	4,256
Narrow gauge	—	13	13	—	9	164
F.H.R	12	—	12	3	26	364
P A P R	*	*	100	16	300	1,150
N W R	*	*	6	—	19	94
Th R . Metre gauge	*	*	20	—	65	334
Narrow gauge	*	*	10	—	20	32
H Elec R.	—	—	—	—	65‡	62

Source *Annuaire statistique de la Grèce*, 1939, p. 241 (Athènes, 1940).

* No information available.
† Includes 1 petrol engine
‡ 34 electric motor coaches, 31 trailers.

however, was there much margin for a great increase in traffic. As regards locomotives, the number per mile of line in all Greece was only 0 23, a lower figure than for any other country in Europe except Latvia, and comparing with 0 39 for Jugoslavia and 1 06 for Great Britain. As for passenger coaches, the Greek figure of 0·51 per mile of line (which is slightly swelled by the relatively large stock of the Hellenic Electric railway) compares with 0·60 for Jugoslavia and 2 20 for Great Britain, while for goods wagons the Greek figure is 3·9 per mile of line, compared with 8·9 for Jugoslavia and 67 7 for Great Britain.

The geographical nature of the Greek railway system results in some curious contrasts in locomotive types, especially as between the huge ten-coupled engines which work passenger and freight trains on the heavily graded standard-gauge lines of the State railways, and the diminutive tank engines which work light branch traffic on the narrow-gauge lines (Plates 105 and 110). The standard passenger locomotives which work the Orient Express line between Idhoméni, Thessaloníki and Piraiévs are of 2-10-0 wheel arrangement, with driving wheels 1,450 mm. (4 ft. 9 in.) in diameter—strikingly different from the 4-6-2 and 4-8-2 engines, with wheels over 2,000 mm. (roughly 6 ft. 9 in.) in diameter, which work expresses in western European countries. The small driving wheels are necessary in view of the steep gradients which are encountered, and the use of five axles instead of three or four enables a greater total adhesion weight to be obtained within the limits imposed by the axle-load permitted on the permanent way (see below). The standard freight

engines on the State railways are also ten-coupled (Plate 114). On the P.A P. railway the locomotives as a whole are of necessity much smaller owing to the narrower gauge; eight-coupled passenger and freight engines are usual (Plate 115), and it is a common practice, especially on the mountainous trans-Pelopónnisos line, to employ two engines on each train. The average age of the P.A.P. locomotives is much greater than that of the State railway engines; about one-half of the present stock on the State lines, including all the 2-10-0's and most of the 0-10-0's, was built in the late 'twenties, whereas the P.A.P. has added little or nothing to its stock, except Diesel railcars (Plate 117), during the last twenty years.

The rolling stock of the Greek railways is entirely of foreign origin, since there is no engineering industry in the country capable of building locomotives, coaches or wagons. The chief sources of supply have been Germany, Austria, Belgium and Czechoslovakia. There are works capable of dealing with heavy repairs at Piraiévs (Áyios Ioánnis) and at Thessaloníki on the State lines, and at Piraiévs for the P.A.P. railway.

Permanent Way and Axle-load

The maximum permissible axle-load on any section of line depends on a number of factors, chief of which are the weight per unit length of the rails and the strength of the infra-structure, i e. the road-bed, including bridges and viaducts. The standard axle-load in Britain is 22 tons, but this is higher than in most countries, and the maximum on any Greek line is 18 m. tons, on the Orient Express route between the Jugoslavian frontier and Piraiévs. The permanent way on this line consists for the most part of flat-bottomed rails weighing 88 lb /yd. (44 kg /m.), laid on steel sleepers. The other lines of the State system have rails weighing 60–68 lb./yd. on steel sleepers, the axle-load allowed on these lines is only 14 tons, and the same figure applies to the Franco-Hellenic railway.

The metre-gauge lines are of lighter construction. Rails weigh only 40 lb./yd. on the P.A.P., and 42 lb./yd. on the Thessalía lines, in each case laid on oak sleepers. The axle-load on these railways scarcely reaches 10 tons.

Line Capacity

The capacity of a railway line to accommodate trains varies very widely in accordance with a number of factors, amongst which are

the number of tracks, the frequency of passing loops on single-track lines, the possible speed (itself a function of gradient, curvature and permanent way), the terminal facilities, the type of traffic to be dealt with, and the quantity of rolling stock available. In Greece all the railways except the Hellenic Electric line are single track, and distances of more than 10 miles between passing loops are not infrequent; moreover, the rolling stock position would not favour a great increase in traffic over and above that of the immediate pre-war years 1937–9. In general, single-track lines such as those in Greece have a theoretical capacity of between six and eighteen trains each way per day. Double-tracking would allow perhaps sixty or seventy trains each way. The Hellenic Electric Railway, with double track and automatic colour-light signalling, can run trains at the rate of ten per hour. In the summaries which precede the line descriptions, estimates of capacity made in 1939 are given, in which it is shown for example that the Piraiévs-Thessaloníki line could cope with eighteen trains each way per day, the Piraiévs-Pátrai line with not more than six. It should be remembered, however, that these figures relate to the individual lines only. Traffic at this density could hardly be maintained over the whole system simultaneously, even for a day or two, for the rolling stock and terminal facilities, especially for goods traffic, would not allow it. Another significant point is that a freight train on the standard-gauge lines can carry a far greater tonnage than one on the narrower gauges, simply by reason of the greater wagon capacity and the availability of greater engine power. The average capacity per wagon on the State lines is about 18 tons; on the P.A.P it is only about 7 tons. Thus a single engine can haul a thirty-five wagon train, loading some 600–700 tons, over the mountainous line between Piraiévs and Lárisa; over the Kórinthos-Kalámai line of the P.A.P. the maximum load is twenty trucks, carrying about 120 tons, and requiring two engines most of the way. The theoretical capacity of the former line for moving freight between Piraiévs and Lárisa is thus of the order of 12,000 tons per day (though the two terminals could scarcely cope with goods in such quantities); the figure for the trans-Pelopónnisos line is only 720 tons

Fuel Consumption

Almost the whole of the fuel used on the Greek railways is normally imported. It consists of coal and briquettes. In addition, a variable amount of home-produced lignite is used, the quantity depending

on economic circumstances. On the State lines in 1937–8 the consumption amounted to 110,000 tons, including only about 100 tons of lignite. In 1933–4, however, the total consumption of 70,000 tons included 11,000 tons of lignite.

Traffic

It was pointed out at the beginning of this chapter that the intensity of both passenger and freight traffic on the Greek railways is low compared with that of the highly urbanized and industrialized countries of western Europe, while freight traffic is of small dimensions even in comparison with that of the other Balkan countries.

For purposes of comparison, simple totals of passengers and freight carried are of little value since the figures clearly depend to a large extent on the length of line operated. The intensity of utilization is better measured by relating the number of passengers and the distance they travel to the total length of line, i.e. 'passenger-miles per mile of line', or, with goods traffic, 'ton-miles per mile of line'. Using such figures, the following table serves to compare the Greek railways as a whole with those of other countries. The figures relate to the year 1937–8:

Country	Passengers—thousands	Passenger-miles per mile of line—thousands	Freight—thousand tons	Ton-miles per mile of line—thousands
Greece	31,100	292*	2,510	100
Bulgaria	11,610	225	6,243	329
Jugoslavia	56,136	310	20,747	443
Belgium	194,814	1,232	64,355	1,808
Germany	2,041,714	998	546,987	1,523
Gt Britain	1,244,083	1,055	351,652	865

Figures for Greece from *Annuaire statistique de la Grèce*, 1938, p 242 (Athènes, 1939), for other countries from *Statistique Internationale des Chemins de Fer*, 1938 (Paris, 1939) (which takes account only of the Hellenic State and the Franco-Hellenic lines in Greece)

* This figure relates to the entire Greek railway system, if the two electric lines are omitted, the figure is 206. It may be noted in this connexion that the figure for Great Britain does *not* include the London 'tubes'.

Passenger Traffic

Passengers carried on the Greek railways in 1938 numbered just over 31 millions, but no less than two-thirds of this total is made up

by the traffic on the two Athens suburban electric lines. The traffic is summarized in the following table:

Railway	No. of passengers—thousands	Passenger-miles per mile of line—thousands
Hellenic State	4,724	252
P A P	3,652	190
Franco-Hellenic	199	79
Thessalía	979	155
North-Western	301	76
Pírgos-Katákolon	115	124
Hellenic Electric	19,381	20,152
Attikí (electric)	1,749	2,066
Total	31,100	292

Source. *Annuaire statistique de la Grèce*, 1938, p 242 (Athènes, 1939).

The intensity of passenger traffic—which is a response to geographical circumstances—is well brought out by the last column. The Hellenic electric line, between Athens and Piraiévs, has considerably greater traffic than the Attikí electrified line which serves only one large outer suburb—Kifisiá The State railways, serving the main cities, naturally have a more intensive traffic than the other lines. The North-Western railway serves an area with neither a dense population nor any great industrial or tourist traffic The Franco-Hellenic line serves a rather sparsely populated frontier district, and its crossing of two frontiers is a hindrance to local traffic.

It is possible to make a further analysis of the State Railways' passenger traffic For the last six or seven years before the outbreak of war in 1939, passenger traffic had consistently provided a smaller proportion of the total receipts than freight traffic. The average for 1932–8 was 43%. In actual numbers of travellers, the traffic was not heavy—it has fluctuated during the last decade between three and five millions a year. The reason is not far to seek. The population is not dense, and there are few branch lines to attract traffic from those areas which are at a distance from the main lines; there are few large urban centres other than Athens and Thessaloníki, and no widespread industrialization Actually between one-fifth and one-quarter of all the passengers start their journeys either at Thessaloníki, which has three lines radiating from it, or at the capital city of Athens.

The following table shows the number of passengers originating on each of the main lines:

Passengers, in thousands, 1937–8

Piraiévs-Platí line	1,969
Thessaloníki-Alexandroúpolis line	1,508
Thessaloníki-Flórina line	1,284
Thessaloníki-Idhoméni line	206
Saraklí-Stávros line	58
Total	5,025

Source: *Statistique*, 1937–8, p. 44 (Chemin de Fer de l'état Hellénique, Le Pirée, 1939)

The relatively small traffic on the Idhoméni line is due to the restricted area of Greece which it serves, and to the fact that it leads to a political frontier. It is true that as a part of the Orient Express route to Athens it carries some international passenger traffic, but the amount is small—about 6,000 passengers each way in 1937–8. The international traffic using the Alexandroúpolis line to reach Bulgaria and Turkey is of even less significance The rather surprisingly high traffic on the Flórina line is in part due to the through traffic from Thessaloníki to Athens, which uses this line as far as Platí junction

Freight Traffic (Figs. 77–9; Plate 119)

Apart from Albania, which has no railway, Greece is the poorest of the Balkan countries in economic resources. With only a limited area available for agriculture, and lacking large mineral fields, it is not surprising that the freight traffic should be of small dimensions. The following table compares the tonnage and traffic intensity on each of the different railways:

Railway	Freight—thousand tons	Ton-miles per mile of line—thousands
Hellenic State	1,703	141
P A P.	422	68
Franco-Hellenic	104	45
Thessalía	195	58
North-Western	28	14
Pírgos-Katákolon	48	44
Hellenic Electric	9	8
Attikí (electric)	1	0 5
Total	2,510	100

Source *Annuaire statistique de la Grèce*, 1939, p 242 (Athènes, 1940)

Just as the total traffic is a reflexion of the geographical circumstances of each railway, so, to an even greater extent, is the nature of the commodities carried. On the Greek railways as a whole, the freight traffic in 1936 was made up as follows:

Commodity group	Percentage of total traffic
Cereals and flour	18 9
Ores	12·3
Vegetables and fruit	8 9
Coal and other fuels	8·5
Constructional materials	6 0
Food products	5 4
Live animals	4 4
Manufactured goods	3·6
Earth and cement	3·5
Miscellaneous	28 5

Source. *Annuaire statistique de la Grèce*, 1938, pp. 243–4 (Athènes, 1939)

Fig. 77 shows, as far as available statistics will allow, the way in which the traffic on each of the minor railways is made up. The

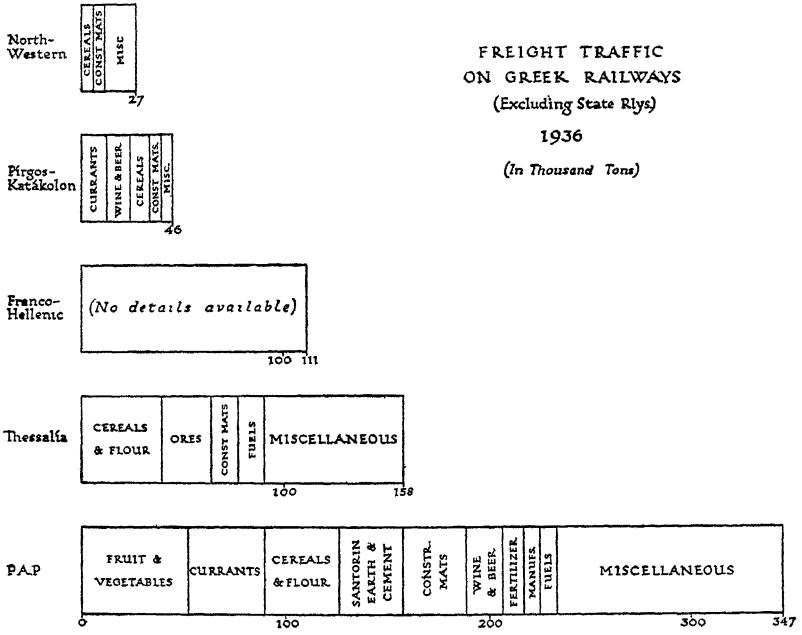


Fig. 77. Freight traffic on the Greek railways (excluding the Hellenic State Railways), 1936

Based on data from *Annuaire statistique de la Grèce*, 1938, pp 242–4 (Athènes, 1939)

traffic of the P.A.P. railway reflects the agricultural environment of the Pelopónnisos, with its rich peripheral vineyards, orchards and cultivated fields. The Thessalía railway serves three possible sources of traffic, the agricultural plains of Thessalía, the chrome orefields, and the port of Vólos. The diminutive Pírgos-Katákolon line serves a part of the important currant- and wine-producing plain of Ilía,

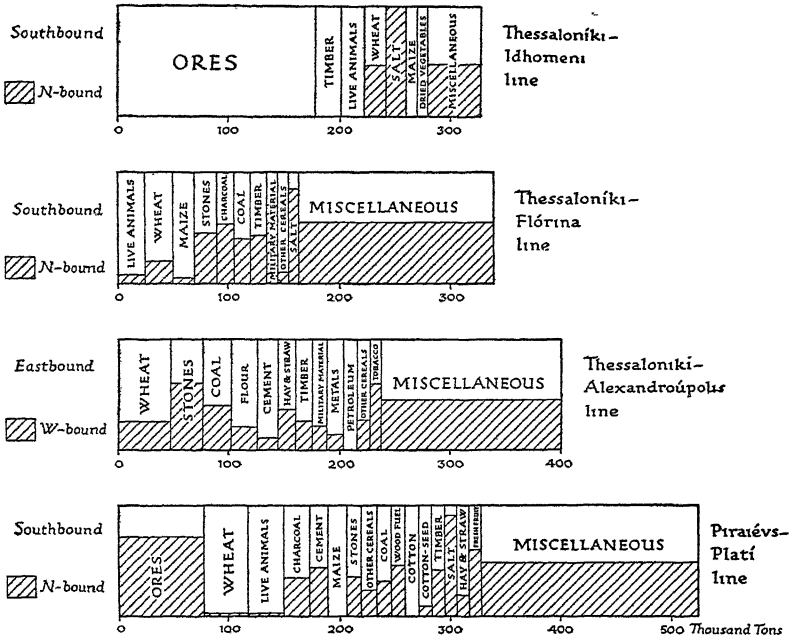


Fig 78 Freight traffic diagrams for the four main lines of the Hellenic State Railways for the year 1937–8

Based on data from *Statistique*, 1937–8, pp 99–100 (Chemin de Fer de l'état Hellénique, Le Pirée, 1939).
The diagrams show the proportion of the total traffic represented by each commodity, and also the direction of movement. For further explanation see text.

and one-half of its traffic consists of these two commodities. The North-Western railway has also a mainly agricultural traffic, in which cereals and tobacco are dominant.

Fig. 78 shows the character of the freight traffic on the four main lines of the State Railways. The traffic included is only that carried commercially, amounting to nearly 1·6 million tons; the remainder of the 1937–8 total—some 300,000 tons—represents freight carried in the service of the railway company. Nearly one-third of this

latter comprises imported locomotive coal for use at the various engine sheds.

Two commodities are outstanding in the list of goods carried: they are mineral ores and cereals, each representing about 15%,

Fig 79 Freight traffic on the Hellenic State Railways by stations for the year 1937–8

Based on data from *Statistique*, 1937–8, p 91 (Chemin de Fer de l'état Hellénique, Le Pirée, 1939).
The circular graphs are proportional in area to the amount of traffic dealt with at the principal stations; only those stations handling more than 6,000 tons of freight are shown.

more or less, of the total tonnage. The ores are partly chrome from Thessalía and the highlands around Lake Xiniás, partly magnesite from Évvoia, and partly lead and zinc concentrates travelling from Jugoslavia to Thessaloníki for export.

On the Piraiévs-Platí line, chrome and magnesite comprise the

ore traffic; cereals and live animals are mainly south-bound to the markets and abattoirs of Athens, cotton and cotton-seed originate in the Lake Kopaís basin; salt moves northwards from the marine salt-pans of the Katerini district, and coal traffic comprises north-bound imported coal and south-bound lignite from the mines west of Katerini.

On the Alexandroúpolis line, considerably more traffic moves eastwards, from the port of Thessaloníki, than westwards towards it. Imported cereals, coal and oil fuels and manufactures move east, whilst apart from 'stones' which move locally in both directions the main west-bound commodity is tobacco, from the plains of Kaválla and Dráma.

The Flórina line has much south-bound traffic in cereals and animals, destined either for Thessaloníki or for the Platí-Piraiévs line The chief item almost exclusively north-bound is salt from the coastal salt-pans.

The Idhoméni line carries considerable quantities of Jugoslav produce to the Free Zone of Thessaloníki port, notably lead and zinc concentrates and timber, while from Greek territory animals and foodstuffs move south to Thessaloníki. Once again salt is a significant north-bound item.

Conditions since 1941

The Greek railways, owing to their physical nature, are very vulnerable, and during the military operations in the spring of 1941 many great bridges and viaducts were blown up during the British and Greek retreat. For a whole year through traffic from Thessaloníki to Athens was suspended owing to damage to bridges and viaducts, especially on the Graviá-Lianokládhion section, where amongst others the famous Gorgopótamos and Papadhiá viaducts were partially destroyed. Traffic was diverted from Lianokládhion along the branch to Ayía Marína and Stilís, and a fleet of caiques kept up a freight service between those ports and Khalkís, whence the branch to Oinóï and the main line could then be followed southwards. A meagre passenger traffic was carried by road across the mountains between Graviá and Lianokládhion.

The Alexandroúpolis line was interrupted by the destruction of the Strimón bridge, and through communication on the Orient Express route from Bulgaria to İstanbul was suspended for 15 months through the destruction of the bridges over the Árdhas and Évros

rivers. The P.A.P. line was interrupted by the destruction of the bridge over the Kórinthos Canal.

Shortage of rolling stock over the whole country, but particularly in the north—for the Greeks and British moved many locomotives southwards and so immobilized them owing to the break in the line—hampered German and Italian military traffic, and German locomotives and wagons had to be brought in. Even more serious, however, was the shortage of coal, which brought passenger traffic almost to a standstill and caused the complete stoppage of the Hellenic Electric line during the winter of 1941–2. The only coal available had to be imported either from Germany or from the Bulgarian lignite field at Pernik.

With the complete re-establishment of rail traffic in the summer of 1942 a programme of improvement works was embarked upon—but the plans had quite obviously a strategic and not an economic purpose, being designed to increase the capacity of the lines for moving troops and war material southwards to the ports for transhipment to North Africa. New passing loops and sidings at many stations, and the enlargement of the yards at Thessaloníki and Athens (Rouf) were put in hand, and it was proposed to convert the P.A.P line from Piraiévs to Návplion to standard gauge.

Some administrative reorganization became necessary, partly as a result of frontier changes which gave the greater part of Dhitikí Thráki to Bulgaria, and partly through the divided control, German and Italian, of the territory remaining to Greece. In the north-east, the Franco-Hellenic line, which forms Bulgaria's long-desired outlet to the Aegean, was divided into two parts, the Svilengrad-Píthion section being handed over to Turkish administration, and the Píthion-Alexandroúpolis section being controlled by the Germans. The Alexandroúpolis-Thessaloníki line came under Bulgarian control as far west as the new frontier at Porróia, about 19 miles west of the Strimón bridge.

The remainder of the Hellenic State lines were reorganized under the title 'Staatsbahntransportstelle' into two divisions, one from Piraiévs to Lamía, with headquarters at Athens, and the other comprising all lines north of Lamía, with headquarters at Thessaloniki.

The P.A.P. line, under Italian control, became 'Commando Italiane Ferrovie Grece'.

Bibliographical Note

General. Literature on Greek railways is not extensive A useful historical summary to the year 1912 will be found in the article 'Griechische Eisenbahnen' in vol. v of von Roll's *Enzyklopädie des Eisenbahnwesens* (Berlin, 1914)

Articles giving general historical, descriptive and technical information include the following:

'The Hellenic State Railways', *Railway Gazette*, vol. LVI, p. 334 (London, 1934); *Railway Magazine*, vol. 87, pp. 62–70 (London, 1941)

S H. Beaver, 'The Hellenic Electric Railway', *Railway Gazette*, vol. 62, p. 674 (London, 1935)

S. H Beaver, 'Railways in the Balkan Peninsula', *Geographical Journal*, vol. XCVII, pp. 273–94 (London, 1941).

Statistics Summarized statistics of rolling stock, operation and finance for the Hellenic State Railways and the Franco-Hellenic line will be found in *Statistique Internationale des Chemins de Fer*, published by the Union Internationale des Chemins de Fer (latest edition 1938; Paris, 1939) Greater detail for the State Railways is given in their annual statistical report—*Statistique*—the latest available relating to the year 1937–8 (Le Pirée, 1939). For the remaining railways, summary figures are given in *Annuaire statistique de la Grèce* (Athènes, annually).

Maps. The best general map is G.S G S. 3884*a*, scale 1 · 1,000,000 (second edition, 1941).

Appendix I

ATHENS AND OTHER CHIEF TOWNS

According to the official population estimates published in the *Bulletin mensuel de statistique, Décembre* 1939, p. 739 (Athènes, 1940) there were in Greece on 31 December 1937 twenty towns with more than 20,000 inhabitants. Twelve of these towns are seaports and are dealt with in Chapter VIII. The remaining eight are discussed in the following account, among them, Kallithéa, a suburb of Athens. The growth of these towns is given in the table on p. 39, and their regional distribution is described in Chapter I.

Athens (494,080)

General Features

Athens (Athínai: colloquially, in the singular, Athína) lies in the plain of Attikí surrounded by mountains. To the north lies Párnis (4,626 ft.); to the west, Koridhallós, or Aigáleos (1,535 ft.); to the north-east, Pendelikón or Vrilessós (colloquially Pendéli) (3,637 ft.); and to the south and south-east, Imittós (3,369 ft.). A chain of hills runs across the plain; the northernmost, the range of Tourkovoúnia (1,073 ft.), ends abruptly in the conical hill Likavitós (Áyios Yeóryios), the most conspicuous height (912 ft.) in Athens (Plate 120). Other hills are those of the Acropolis (512 ft.), the Areopagus (377 ft.), and the three-crowned Pnyx hill, whose highest point reaches 485 ft. The Acropolis is a little over 3 miles from the sea.

The plain of Attikí is ill-watered. Its largest river, the Kifisós, to the north of Athens, flows throughout its length only in flood-time; and the Ilissós, to the south, is mostly dry, though heavy rain may make a torrent of it. Other streams, or stream-beds, whose names are preserved from antiquity, no longer exist. Until the completion of the Marathon dam in 1931, the water-supply of Athens was provided by the repaired Roman aqueduct, and spring-water for drinking was sold in jars; but now the city is fully supplied with healthy water, nearly everywhere laid on to the houses.

History

The Acropolis hill was occupied in Neolithic times, and the ancient Athenians claimed that their race was 'sprung from the soil'. Athens,

though its plain provides but light and shallow soil, was well placed for political eminence. It could control the passage of the isthmus dividing northern and central Greece from the Pelopónnisos, and its access to the sea invited maritime trade and power. The gathering-together of the tribes of Attica into one city was by tradition the

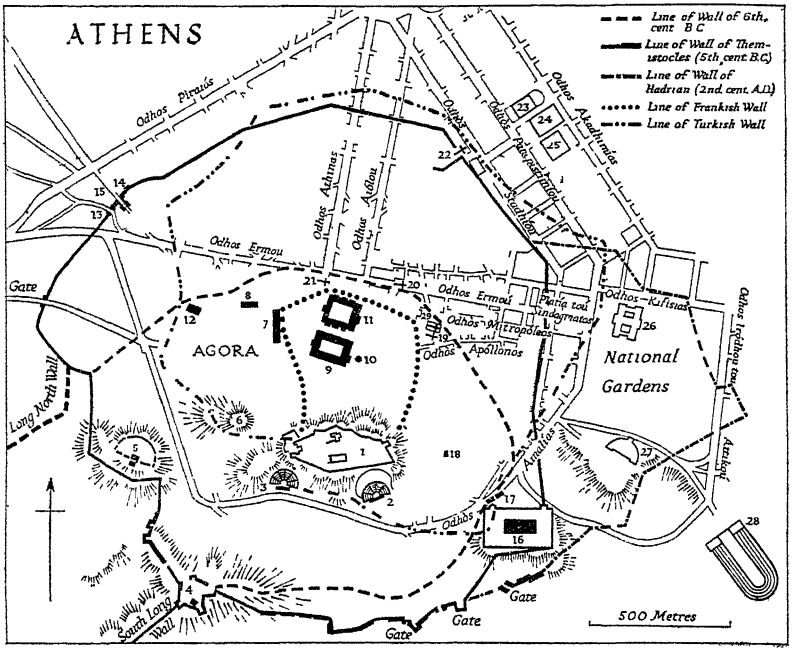


Fig. 80. The walls of Athens

Based on plans in *Les Guides Bleus—Grèce*, pp 11 and 20 (Paris, 1935)
Classical Monuments: 1. Acropolis; 2. Theatre of Dionysus; 3. Odeum of Herodes Atticus; 4 Tomb of Philopappos; 5 Pnyx, 6. Areopagus, 7. Portico of Attalus, 8. Portico of the Giants; 9. Roman Market; 10. Tower of the Winds, 11 Library of Hadrian, 12 Theseum (Temple of Hephaestus), 13 The Sacred Gate, 14. The Dipylon Gate, 15. Cemetery, 16. Temple of Olympian Zeus; 17 Arch of Hadrian, 18. Monument of Lysicrates *Byzantine Churches* 19 The Old Cathedral (Áyios Elevthérios), 20. Church of Kapnikaréa, 21. Church of Our Lady of the Great Monastery, 22 Church of Saints Theodore. *Modern Buildings* 23 University Library; 24. University; 25 Academy, 26. Royal Palace; 27 Záppion (containing the studio of the Athens broadcasting station), 28. Stadium; 29 New Cathedral.

work of King Theseus. By the seventh century B.C. Athens was a state of some importance; and in the sixth it developed its characteristic democratic constitution. During the fifth and fourth centuries B.C. it became the centre of an empire in the Aegean, and developed a civilization that was to be the admiration of all later time (see vol. I, p. 139 et seq. of this Handbook).

Though Athens lost its first empire after the Peloponnesian War (431–404 B.C.), it took a leading part in the politics of the fourth century, especially as the champion of liberty against Philip of Macedon. He, however, established his power by his victory at Chaeronea in 338 B.C., and Macedonian rule continued, with brief interludes, until Macedon itself fell in 168 B.C. to Rome. During all this time, Athens was held in high honour by its political masters, as the fountain-head of Greek civilization and as a centre of intellectual life. But when in 88 B.C. it allied itself with Rome's enemy, Mithridates, Sulla razed its walls and destroyed its military establishments. Thereafter, Athens flourished purely as a university town, to whose schools young Romans and others flocked for learning, and to whose monuments tourists paid homage. Kings of the East and Roman potentates and emperors enriched it, adding magnificently to the splendour of its buildings (see vol. I, pp. 418–26, of this Handbook).

After the decline of Rome, Athens, now included in the Byzantine, or Eastern Roman, Empire, in spite of the menace of barbarian invaders maintained its ancient cults and philosophy, until in A.D. 529 Justinian closed its schools and turned its temples into Christian churches The Parthenon and other temples were subjected to this change, and, in 869, the see of Athens became an archbishopric. During these centuries it was merely a provincial city of the Byzantine Empire, and its material condition steadily declined. When Byzantium (Constantinople) fell to the Crusaders in 1204, Athens passed to the rule of successive western dukes, who held it until its conquest by the Turks in 1456.

Turkish rule still further depressed the economic and social state of Athens, and the Parthenon now became a mosque. Other historic buildings were put to secular uses. When in 1687 the Venetians, under Morosini, were attacking Athens, a shell exploded powder stored in the Parthenon, which had survived intact and in use for 2,100 years, and blew it to a ruin. Other ancient monuments were sacrificed to the building of a new town-wall with which in 1778 the Turks surrounded the much diminished city; and more damage was done during the War of Independence, when the Acropolis more than once changed hands, until finally Athens was made the capital of the liberated Hellenic nation in 1833. The town at that time was little more than a large village, of less than 5,000 inhabitants, lying on the northern and eastern slopes of the Acropolis. But the commercial advantages of Corinth, Patras and Nauplia as the seat for the capital were outweighed by the historic claims of Athens.

The new capital was laid out in squares and straight lines to the north and east of this. The population increased rapidly. It had risen to some 45,000 by 1870, and twenty years later to 108,000. In 1907, it was about 170,000, and since then the city has grown very greatly in population and size through the arrival of refugees from Asia Minor in 1922, and through industrial development which was aided by the completion of the Marathon dam in 1931. The population of Athens and Piraiévs, which are now practically one city, numbered probably one and a quarter million before the German occupation of 1941.

Ground Plan

The small area on the northern slopes of the Acropolis which constituted Turkish Athens was left as it was by the architects of King Otho's capital, and remained a picturesque huddle of houses and lanes, of which since 1931 a large part has been expropriated for archaeological excavation. The architects, taking a point some three-quarters of a mile north of the centre of the Acropolis, made the large square, the Platía tis Omonoías ('Omónoia') the centre from which they spread an inverted fan of geometrically disposed streets over the flat land between it and the slopes. With Omónoia as the apex, and the Odhós Ermoú as a base-line stretching from the Platía tou Sindágmatos ('Síndagma') on the east to the site of the ancient Dipylon Gate and Cemetery on the west, and joining these three points, the architects made a triangle of which the sides are the Odhós Ermoú (south), the Odhós Stadhíou (east), and the Odhós Piraiós (west). The triangle is bisected by the Odhós Athínas, which runs from Omónoia to the middle point of the Odhós Ermoú. Other important streets are the Odhós Aiólou, parallel to the Odhós Athínas, the Odhós Panepistimíou, and the Odhós Akadhimías; these two are parallel to the Odhós Stadhíou. Within this compass are the chief government buildings, the University and Academy, the banks and large commercial offices and shops.

But the city has grown on all sides where the lie of the land favoured it, especially to the north and north-east. The best residential areas are on the Patíssia and Kifisiá roads. When the refugees arrived in 1922, to the number of some 223,000 for Athens and Piraiévs, large settlements were built for them. Some adjoined the city, particularly round Likavitós, which is now wholly encircled; others were built in Patíssia, in the regions of Pangrátion, Víron ('Byron') and Iliópolis to the east and south-east, and between Athens and Fáliron (at Kallithéa), while others formed new and detached suburbs. Thus

Kifisiá and Amaroúsion have grown greatly, and there are settlements such as Psikhikó on the road to Amaroúsion on the eastern slope of Tourkovoúnia, where the extension has reached Khalándri. Other settlements were established to the south-west and north, reaching in the latter direction almost to Iráklion, with large quarters at Néa

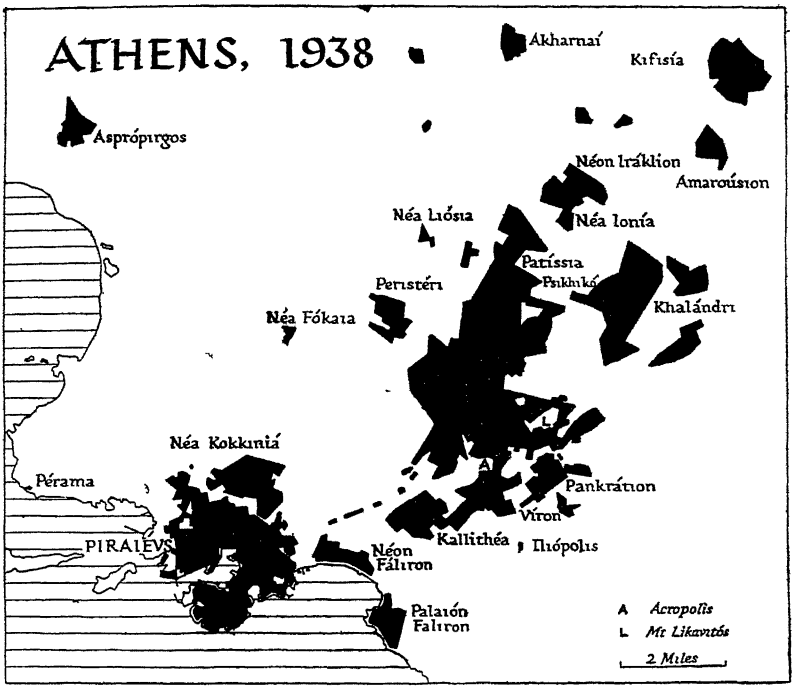


Fig. 81. Athens: built-up area in 1938

Based on *Epitelikós Khártis tis Elládhos*, 1:100,000, sheets I ix, I x, K ix and K x (1940–1).
The built-up area has been greatly extended since the arrival of the refugees from Asia Minor in 1922. Many of the suburbs of Athens, especially those prefaced by 'Néa', owe their growth to the establishment of large refugee settlements there, while in the case of the nearby towns the urban area has noticeably expanded. Many small factories and industrial buildings are situated in the area between Athens and Piraiévs but they do not constitute a built-up area. Aspróprgos was formerly named Kalívia.

Ionía and Káto Liósia. Further, recent industrial development has covered the low-lying land between Athens and Piraiévs with factories and made the two into one city on the south-west and south. But to the west there has been little extension. Figs. 80 and 81 show the growth of Athens from the primitive settlement on the Acropolis to modern times.

Administrative Functions

As the capital of Greece, Athens is the seat of government. The old Palace, in Sindagma, was built in 1934–8; in 1922 it was given over to refugees, and in 1930 the site was adopted for a new Parliament house to replace the *Voulí* (Chamber of Deputies) in Odhós Stadhíou. Besides being the seat of government, Athens is the head of the nomarchy of Attikí and Voiotía, of the eparchy of Attikí, and of its own demarchy. The Archbishop of Athens is also Primate of all Greece, and as such presides over the Synod which is the supreme ecclesiastical body in the country. There are also a Roman Catholic archbishop, an Armenian archbishop, and a Jewish rabbi. Athens is divided into forty-two church parishes (*enoríai*), but these do not correspond with the administrative districts (*sinoikismoí*), fifty-nine in number. In addition to the Greek cathedral and many other churches, there are four Roman Catholic churches, two Presbyterian, one Anglican, one Armenian, and a synagogue.

The police are disposed in eight divisions. The *Astinomía*, a body created in 1923 and organized on English lines, had sole charge for some months in 1925, but in October of that year public safety was placed again in the hands of the gendarmerie, and the functions of the *Astinomía* were limited to the control of markets, of wheeled traffic, of street-cleaning and other auxiliary services. The streets need frequent cleaning, and sea-water is used for laying the dust, which, though reduced by the macadam covering of many streets, is still an unpleasant feature of Athens.

Athens is the administrative centre for public education, and has its own University, three-quarters of whose students take Law or Medicine. Other places of higher education include a Polytechnic College, a Commercial School, Schools of Forestry and Agriculture, of Military Science, of Fine Arts and Physical Culture. The Marásleion is devoted to the training of teachers. There are many secondary schools, including the Arsakíon (for girls), technical, commercial and night schools. There are some fifty private schools, and others under foreign management.

Museums include the great national collection, with ancient inscriptions (*epigrafaí*) in the basement, the Acropolis Museum, historical, ethnological, numismatic and Byzantine collections, and a National Museum of Decorative Arts. Besides the National Library there is an important library attached to the *Voulí*, and philological and archaeological libraries, and a picture gallery. Athens is the

centre of the State Archaeological Service, and the seat of foreign Schools of Archaeology (American, Austrian, British, French, German and Italian: attached to the American School is the Gennadion, a valuable library.

The beautiful National Garden, extending over 475 acres to the south of the former Royal Palace, includes in a square the Záppion, used for industrial and agricultural exhibitions. To the east of the Garden are the new Palace and the Amalíion, an orphanage, to the south-east is the restored Stadium.

Hospitals include the *Evangelismós*, the Municipal Hospital, and an Ophthalmic Hospital. There is a Pasteur Institute.

Economic Importance

Athens proper is a business centre rather than a manufacturing town. Nevertheless, it has many factories, especially in the area between it and Piraiévs, and in Kallithéa and the region of Néon Fáliron. Its industries cannot be distinctly separated from those of Piraiévs. They include a variety of miscellaneous trades—textiles, wine-making and brewing, the distillation of alcohol, potteries, flour-milling, soap-making, the lighter engineering trades (including the repairing of machinery, and the making of agricultural implements), tanning, chemical manufactures (including acids, glucose, dyes and paint-making, pharmaceutical and toilet supplies, and agricultural fertilizers), tobacco manufacture, oil-cake and oil-seeds, sweets and chocolate, macaroni and similar commodities, joinery, rubber goods (particularly footwear), electrical supplies such as accumulators, lamps and insulating wire, some boot and shoe making, paper-making, printing, and, as in all Greek towns, ice factories, and a little canning of vegetables (Plate 121).

Many of these industries were carried on, up to the time of the German occupation, on a relatively small scale, and proved capable of meeting most of the needs of the country.

Communications

Athens is the centre of the Greek railway system, and the termini at Piraiévs have paramount importance. Railway communications are, however, of comparatively recent growth The earliest line, the short passenger railway from Athens to Piraiévs (extended in 1937 to Pérama), was finished in 1869, and later carried underground to Omónoia; it was electrified in 1904, and carries more passengers than all the rest of the Greek railways. The metre-gauge line to

Lávrion, completed by 1890, was taken over by the Pelopónnisos company in 1930, and electrified as far as the suburb of Kifisiá. To the same date belongs the metre-gauge Pelopónnisos railway, the P.A.P. (Piraiévs-Athínai-Pelopónnisos), steam-worked, which provided service to Kalámai. Athens is also connected by the Hellenic State railways (standard-gauge) northwards to Thessaloníki, and so to the great European system (Plates 118 and 119).

There are two principal main roads from Athens, both of which are equally approachable from Piraiévs. The first is the ancient 'Sacred Way' through Dhafní and Elevsís and thence across Mount Koridhallós to Thívai. The second road leaves the first at Elevsís and goes west to the Pelopónnisos through Mégara. Secondary main roads in Attikí are one which runs *via* Dhekélia to Skála Oropoú, branching off also to Khalkís; another which serves Lávrion, *via* Markópoulon; and a third which runs to Marathóna.

The sea-communications of Athens are described under Piraiévs. A Greek will more often than not choose to travel or to send his goods by sea, and the local maritime services are of major importance. It need hardly be said that the ancient reliance of the Athenians on the sea has been vastly increased by the cutting of the Corinth canal in 1893 (see p. 307).

The civil airfields for Athens are at Fáliron, where the Italian *Ala Littoria* maintained a service from Brindisi *via* Kérkira; at Néa Péramos (Megálo Pévko), a refugee settlement 22 miles from Athens on the road to Mégara, whence *Air-France* had a service to Marseilles *via* Kérkira; and near Tatóï (Dhekélia) (close to the railway station, to the south of the village), from which the *Société Hellénique de Communications Aériennes* maintained services to Thessaloníki, Dráma, Agrínion and Ioánnina. Here, too, was the military airport.

Local transport is provided by an extensive system of electric trams and buses, serving both the city and its suburbs (Plate 122). Buses go to places as far distant as Thívai, by mountain roads. About 1930, many buses formerly used in London plied the streets of Athens. Until the late '20's, the horse-drawn carriage was the customary vehicle for hiring, but it has been replaced by the motor-cab.

Dráma (35,120)

Dráma lies at the northern edge of a broad and recently drained plain, at the foot of the Falakrón mountains (Boz Dag). It stands at a height of 344 ft. on both banks of the river Drámas, a tributary

of the Angítis which, in turn, joins the Strimón. The town is the seat of a nomarchy and of a bishopric, and is a military and gendarmerie centre. It has legal functions, controls the postal service of Eastern Makedhonía, and maintains a translating office. It has also a Tobacco Research Station, under government control. There are two civil hospitals, one military hospital, and a gymnasium for boys.

Dráma was occupied by the Turks in the fourteenth century, and retaken by the Greeks in 1912. The Bulgarians took it in 1917, but the Greeks were able to reoccupy it in 1918. Its population, some 19,000 in 1913, was increased by the arrival of refugees in 1922, and by 1928 reached nearly 30,000.

The importance of Dráma lies in its trading and strategic position, and in its relation to the port of Kaválla (see p. 266). It has, however, a few factories of its own, including two refrigerating plants, two ice factories, three electric-light works, flour-mills, etc. The mountain torrent (Drámas) which runs through the market-place needs regulation, for it gives no constant flow, and at times overflows its banks. Drinking water is supplied by two old conduits called Ravíka and Drianévos, and by a small pumping station. The exploitation of excellent springs to the south, Ayia Varvára, Karpoúskhaldhirán, Tabákhana and Zírnovon, both for drinking and for light and power, has been projected.

To the south-west, there is both road and rail connexion with Sérrai and Thessaloníki through the Angítis gorge, between the Menoíkion and Pangaíon mountains. Eastwards, the railway continues to Xánthi, and beyond to İstanbul. To the south-east, the main road crosses the plain of Filíppoi, and a 400-ft. col in the Símvolon range, to Kaválla, some 22 miles from Dráma.

Ioánnina (20,540)

Ioánnina is strikingly placed, over 1,500 ft. above sea level, on a rocky promontory on the western shores of the lake named after the town (anciently Pambotis). The lake, 6 miles long and covering 24 sq. miles in area, is nowhere deeper than 35 ft., and appears to have no outlets other than *katavóthrai*. The population is composed of Greek, Albanian and Vlach elements, and about 3,000 Jews whose ancestors arrived at the end of the fifteenth century. The narrow streets of the picturesque town still retain a Turkish aspect. It is the seat of a bishopric, and has law-courts, two gymnasia, and civil

and military hospitals. The town gets its water from wells and from the Krionérios; the utilization of the spring Sendénikos was projected. The town is electrically lighted. It is reported to have been much damaged by German air attacks.

History

The medieval history of Ioánnina is confused. With the fall of the Byzantine empire in 1204, it became part of the despotat of Epirus until it was re-united to the Byzantine empire in 1336. Soon, however, it fell into Serbian hands, but, after the break-up of Stephen Dushan's empire in 1355, it was disputed by Serbs, Albanians and others until it was conquered by the Turks in 1430. Two centuries later, in 1631, the Christian inhabitants were expelled after a rising. But a great period of prosperity and fame came under the Moslem Albanian adventurer, Ali Pasha, whose remarkable career extended from 1788, when he was made Pasha of Ioánnina, to 1822, when the Sultan deposed and killed him. His court at Ioánnina (whose population numbered perhaps 35,000 in 1788) was the centre of a barbaric culture, visited by such travellers as Byron. Ali encouraged the Greek schools, which had been famous since the foundation of the first of them in the thirteenth century, and he used the Greek language and enjoyed the celebration of his exploits in an epic poem composed in Greek. A cunning, hard and bold man, he was respected, and his memory is kept green in song and pictorial art among the mountaineers. Shortly before his fall he had to burn Ioánnina, with its schools, in order to save it from his enemies.

The town was secured for Greece only in 1913, after the Balkan wars. In 1916, Italian troops occupied the place, but were removed on the representations of Venizelos. In 1940 Ioánnina and Métsovon were the two objectives of the Italian army, whose cavalry patrols reached the neighbourhood of the former. But the rout of the Iulia Division of Alpini by the Greek Evzones, employing brilliant mountain tactics and heroically supported by the local population, drove them back into Albania, and saved Ioánnina till April 1941. In this month the Adolf Hitler S.S. Motorized Division, detached from the main German forces which had invaded Jugoslavia and Greece, crossed the Píndhos mountains and occupied the town behind the main body of the Greek army.

Ioánnina in the past was famed for its tanning industry, and its dressing of furs. Skins were provided locally, and also imported

from Russia, and these furs were famous throughout the Balkans. There were seventy workshops, as well as many home-workers, in 1850. Another traditional glory of Ioánnina was the work of its goldsmiths, and its gold and silver embroidery. To-day, the town has little industrial importance.

Owing to the direction of the mountain ridges, the easiest communications are to the north-west, with Albania. A good road leads to Gjinokastër and Sarandë (Santi Quaranta), with an eastern branch to Korçe (Koritsa), whence it secures wider communications, for example, with Thessaloníki and with Bitolj. Another road follows the valley of the Thíamis westwards to Igoumenítsa, and a southern road provides communication with the port of Préveza, and with Árta. A motor road crosses the Píndhos mountains eastwards to Métsovon and Kalabáka. As yet the town has no railway connexions.

Komotiní (32,380)

Komotiní (called Gumuljina in Turkish) lies at about 100 ft. above sea level, towards the eastern end of the fertile plain which separates the eastern Rodhópi from the sea. It is situated on an insignificant stream, called the Karà Su, about 12 miles from the sea coast.

The town is the seat of the government of Dhitikí Thráki and of a nomarchy; it controls the gendarmerie of Rodhópi, and has law courts. Its closeness to two frontiers, those of Bulgaria and Turkey, gives it great military importance. It possesses a gymnasium, and its places of worship include an Armenian church, a number of mosques, and a synagogue. There are civil and military hospitals. The town has electric light, and its water supply is described as adequate. There are a few very small village-suburbs.

Komotiní existed in Byzantine times under its present name, which was later corrupted to Koumoútzina and other forms, until the Turks made it into Goumoultzína. During the later Turkish period it had some 10,000 inhabitants. Assigned to Bulgaria in 1913 after the First Balkan War, it remained Bulgarian until it passed to Greece by the Treaty of Lausanne in 1923. Its population now rose to over 21,000, increased by the arrival of many Greek and some Jewish and Armenian immigrants. By 1930, having absorbed in all some 9,000 refugees, its population numbered 30,000; three-fifths were Orthodox Christians, and most of the rest were Moslems, with some Armenians, Jews and gipsies, occupying each their own quarter. The town recalls its Turkish history by its irregular plan, especially

in the older parts, where the houses have latticed windows. But the one broad street, leading from the railway station to the barracks, is bordered by modern European buildings, including most of the commercial establishments.

The town is an important market for the agricultural merchandise of its plain, notably cereals, sesame, silk, tobacco, some cotton, and the products of stock-farming. A great livestock fair is held annually, in the week of Palm Sunday (*ton Vaïon*). The traffic of Komotiní is handled, by sea, through Alexandroúpolis, as well as overland. Its own few industrial concerns include some flour-mills, sesame factories, a tile-works, several tanneries, an electric power station, and an ice-making plant. Copper and antimony exist in the district.

Komotiní lies both on the railway and on the great main road from Thessaloníki to İstanbul. Another road, of military as well as commercial significance, goes up into the mountains, and crosses the Bulgarian frontier at Nimfaía, some 15 miles to the north of Komotiní.

Lárisa (27,190)

Lárisa is in a central position on the broad cultivated plain of lower Thessalía. It stands on the right bank of the Piniós, where the river makes a great right-angled bend from east to north. The town is the capital of Thessalía, the seat of a nomarchy, and the centre of one of the nine Courts of Appeal in Greece. It also exercises control over the gendarmerie of Thessalía and maintains its own *Astinomía*. It possesses a gymnasium, an airfield, and a race-course.

After a succession of rulers in the Middle Ages, Lárisa fell to the Turks in the fifteenth century, and became the seat of a pasha and a military centre. The Turks called it Yénischer, 'New Town', giving the name of 'Old Lárisa' to the ruins of the neighbouring town of Crannon. Ali Pasha made Lárisa his headquarters in the War of Independence, and descendants of his troops were living in a suburb in the earlier part of the twentieth century. The town did not pass to Greece until 1881, and in 1920 its population was still predominantly Turkish. The town was, however, rapidly losing its Turkish appearance of late, especially in the new and regularly laid-out south-eastern quarter. The population is said to have numbered 30,000–40,000 (of whom only 8,000 were Christians) in the eighteenth century; but by the first decade of the twentieth century it numbered only some 18,000. It has not been enlarged by any substantial

number of refugees. In 1941 Lárisa was destroyed by an earthquake followed by Italian bombing.

Lárisa is primarily a market town, which handles the products of Thessalía and distributes them through the port of Vólos, or by rail. A great fair is held twice a year, beginning on 15 May and 27 September respectively. Industries are small, if numerous. There is some cotton-weaving, tobacco manufacture, olive-pressing, flour-milling, brick-making, wood-working and silk-making, as well as some smithies, an electric power works and an ice-making plant.

Lárisa has two railway stations, one for the standard-gauge State railway from Athens and the other for the metre-gauge line to Vólos. Many roads meet at Lárisa. The chief is the great road from Athens, coming north from Lamía and Fársala, and continuing beyond Lárisa, to Elassón and Kozáni, and thence to Thessaloníki. Western Thessalía is served by roads to Kardhítsa and Tríkkala, while another road strikes south-east to the port of Vólos.

Sérrai (32,030) (Plate 124)

Sérrai is situated 164 ft. above sea level, on the northern edge of the very fruitful basin of the Strimón, where much drainage and irrigation have recently taken place. It is the administrative centre of a nomarchy and is the seat of an archbishopric and of judicial courts. It controls gendarmerie, and has a gymnasium and a hospital.

The Turks took Sérrai in 1368 and held it until the First Balkan War (1912–13). During the Second Balkan War, the Bulgarians were defeated by the Greeks between Sérrai and Thessaloníki, and fled through the Rúpel pass and over the mountains. In their flight they burned the Greek quarter of Sérrai. In 1916, Fort Rúpel was not defended against the incoming Bulgarians, in spite of the spirit of the garrison of Sérrai, which afterwards fought a fine rearguard action to Thessaloníki. In 1918 Sérrai was freed from the Bulgarians, and in 1922 received 13,538 refugees from Asia Minor. The town was rebuilt, though the old Turkish quarter remained. In 1941, the Metaxas Line ran along the frontier to the north of the town, and the Rúpel pass was held for a week against the Germans, until the enemy's western thrust compelled the Greeks to fall back. The Bulgarians followed at the heels of the Germans and occupied Sérrai.

Sérrai is a commercial centre, and is particularly concerned with the development of the cotton-growing industry. Though not an

industrial town, it has some weaving establishments, as well as tobacco factories.

Sérrai is on the main road and on the railway which run from Thessaloníki to Dráma and beyond to İstanbul. It is also on the road which runs from Nigríta, on the southern edge of the Strimón valley northwards into the heights of Falakrón to Káto Nevrokópion and thence across the Bulgarian frontier to Nevrokop. But its most significant line of communication is the road to the north-west through Sidhirókastron (formerly Demir-hissar) and the Rúpel pass into Bulgaria. This pass has figured often in history, and brought on Sérrai the rigours of war.

XÁNTHI (37,290)

Xánthi is attractively situated at the foot of the eastern Rodhópi mountains, separated from the Aegean sea by a fertile coastal plain some 12 miles wide. It is on the river Eskejé, which leaves the mountains in a narrow gorge between the two southern bastions of Rodópi—Karà Oglán and Chal Tepe. It is the seat of a bishopric and of an eparchy, and has a gymnasium and military establishments. It gets its water supply from the river, but the pumping of water from a spring has been projected.

Xánthi was a small flourishing township at the beginning of the nineteenth century, and became the centre of the tobacco industry of north-eastern Greece. The building of the railway (see below) added to its prosperity. It was taken by the Bulgarians during the First Balkan War (1912–13), and when Greece secured it later in 1913, very few of the Greek inhabitants remained. It absorbed some 13,000 refugees in 1922.

Xánthi derives almost its whole importance from the tobacco trade. It has itself some cigarette factories, but apart from these there are few factories—only some flour-mills, a rolling-mill, some hand tanneries and an ice and refrigerating plant.

It is on the railway and the main road from Thessaloníki to İstanbul. Communication with the port of Kaválla, to the south-west, is made by road. A mountain road, of military importance, leads northwards to Smolyan in Bulgaria.

BIBLIOGRAPHICAL NOTE

1 Detailed information on history and administrative functions, and statistics on population and industry, are given for each town in the volumes of the *Megáli Ellinikí Enkiklopaídhia* (Athens, 1927–34); the towns covered are all those which have been under Greek rule since the fixing of the frontiers in 1922 and since the absorption of the refugees which commenced at that time. Short accounts may be found in *Les Guides Bleus—Grèce* (Paris, 1935), which contains more recent information, although only slight information is given for the north-eastern towns. Karl Baedeker's *Greece*, 4th edition (Leipzig, 1909) contains useful information, though it is largely out of date and covers no territory north of Thessalía. Some of the towns are dealt with in the *Encyclopaedia Britannica*, 14th edition (London and New York, 1929).

2. Sir James G. Frazer's *Pausanias's Description of Greece*, in six volumes (London, 1898), is a monumental work from which much information on the towns of Ancient Greece may be gained, the maps and plans illustrating it were reissued and brought up to date in one volume by Sir James G. Frazer and A W. Van Buren, *Graecia Antiqua* (London, 1930) M. N Ellıadı, *Crete, Past and Present* (London, 1933) and S. Casson, *Macedonia, Thrace and Illyria* (Oxford, 1926) deal with particular regions, and C H Weller, *Athens and its Monuments* (New York, 1913) gives an account of ancient Athens.

3 For the part played by certain towns in the war of 1940–1, the following works may be consulted D Garnett, *The Campaign in Greece and Crete*, issued for the War Office by the Ministry of Information (London, 1942), S Casson, *Greece against the Axis* (London, 1941), 'Athenian', *The Greek Miracle*, translated by D. Walker (London, 1942), and Compton MacKenzie, *Wind of Freedom* (London, 1943)

Appendix II

CIVIL AVIATION

Air Transport in Greece

Civil aviation has probably a considerable future in Greece, although at present it is not well developed. On the one hand limitations on its development are imposed by difficult flying conditions, by a lack of many suitable sites for airfields, and by the inability of the country to support any large-scale development of such an expensive form of transport. On the other hand, air transport is very suitable for linking up easily and quickly the different parts of Greece which are so cut off from one another; there are also a large number of bays and inlets which can be utilized as seaplane stations where suitable landplane facilities are absent. Air transport is also the only possible rival to sea transport in communications with the islands.

The Ministry of Air is responsible for the control of civil aviation in Greece. There is a special Civil Aviation Branch, which has published an aeronautical map of Greece in twelve sheets (scale 1 : 400,000; see vol. I, Appendix I, pp. 402–3, of this Handbook), and an air guide giving a detailed description of all the airfields in Greece and useful information on flying conditions over the country. Although various schemes for the development of airways were drawn up in the 1920's, lack of funds delayed government action. Concessions were granted, however, to foreign companies for air communication with neighbouring countries.

Internal air lines are operated by the *Société Hellénique de Communications Aériennes* (*Ellinikí Etairía Enaerion Singoinonion*). This company began regular services in July 1931 and, up to the end of 1938, it operated without accident. In 1939, the company had seven Junkers aircraft and a flying staff of 9 pilots, 3 wireless operators and 4 mechanics. Two main services were operated in 1939 from Athens (Dhekélia, or Tatói, airport) to Thessaloníki (Sédhes) and from Athens to Ioánnina. The former was a daily service (excepting Sundays) and it was extended to Dráma three times weekly. The Ioánnina service ran on each week-day and it made a call at Agrínion. The traffic on each of these routes is given in the table on p. 391.

Civil Aviation Traffic in 1937

Route	Distance in miles	No. of flights	Miles flown	Hours flown	Passengers	Mail kg.	Cargo kg.
Athens-Thessaloníki	230	534	123,318	1,068	3,178	6,758	126,000
Athens-Dráma	317	247	—*	—*	357	424	8,000
Thessaloníki-Dráma	87	248	20,049	186	645	88	7,600
Athens-Ioánnina	230	136	31,268	272	2,247	2,048	28,600
Athens-Agrínion	146	170	24,824	340	404	139	11,700
Agrínion-Ioánnina	84	150	12,636	113	136	21	800

Source: *Annuaire statistique de la Grèce*, 1938, pp. 265–6 (Athènes, 1939).
* Included under Athens-Thessaloníki, Athens-Dráma
The figures include transit traffic.

The Athens-Thessaloníki service operated from 4 January to 30 December, but the extension to Dráma from Thessaloníki was only in operation from 1 March to 16 December. The Athens-Ioánnina route was used only between 1 March and 26 December. The periods of inactivity were largely the result of rigorous winter flying conditions. In 1939, a service was also run from Athens to Iráklion (Kríti) four times weekly.

Passenger rates are relatively low and compete fairly successfully with railway rates. An analysis of the actual traffic compared with the possible traffic, however, shows that all available space was not occupied; the figures are for 1937:

Route	Passenger—miles		Cargo—ton-miles	
	Possible	Actual	Possible	Actual
Athens-Thessaloníki	1,350,496	812,739	139,239	105,254
Thessaloníki-Dráma	125,264	56,109	18,815	9,212
Athens-Ioánnina	591,779	516,604	59,995	53,705
Athens-Agrínion	74,470	58,993	7,161	7,135
Agrínion-Ioánnina	25,166	11,325	2,642	1,058

Source. *Annuaire statistique de la Grèce*, 1938, p. 268 (Athènes, 1939).

The extension of services to surrounding countries has been considered by the company, and lines were envisaged to Egypt, Turkey, Bulgaria, Jugoslavia and Italy.

Foreign Air Lines

All the air services connecting Greece with surrounding countries are operated by foreign companies. Greece lies astride the air routes

from West and Central Europe to the Near East and the Far East, and Athens especially is used as a stopping place by planes on these services. The foreign services crossing Greece in 1939 were as follows:

Imperial Airways Ltd. (now *British Overseas Airways Corporation*)

Two lines: Southampton—Marseilles—Rome—Brindisi—Athens (Fáliron)—Alexandria—thence to India and Australia, *or* to South Africa (intermediate calls were made at Merabéllo—Kríti—and Rhodes when inducement offered).

K.L.M. (Royal Dutch Air Lines)

One line: Amsterdam—Marseilles—Rome—Brindisi—Athens (Dhekélia)—Rhodes (if inducement)—Alexandria (in winter); Amsterdam—Leipzig—Budapest—Athens (Dhekélia)—Rhodes (if inducement—Alexandria (in summer)—thence to the Netherlands East Indies.

Deutsche Lufthansa (German)

Two lines: Berlin—Belgrade—Athens (Dhekélia)—Beirut—Baghdad—Teheran—Kabul.

Berlin — Vienna — Budapest — Belgrade — Sofia — Thessaloníki (Sédhes)—Athens (Dhekélia).

Ala Littoria (Italian)

Three lines: Rome—Brindisi—Athens (Fáliron)—Rhodes.

Rome—Brindisi—Athens (Fáliron)—Rhodes—Haifa—Baghdad—Basra.

Rome—Brindisi—Tirana—Thessaloníki (Sédhes)—Sofia.

Air France

One line: Marseilles—Naples—Kérkira—Athens (Néa Péramos)—Castelrosso—Tripoli (Syria)—Damascus—Baghdad.

L.O.T. (Polish Air Lines)

One line: Warsaw—Athens (Dhekélia)—Lydda—Beirut.

Lares (Roumanian State Air Lines)

One line: Bucharest—Sofia—Thessaloníki (Sédhes)—Athens (Dhekélia). Joint service with *L.O.T.*

Route	Nationality of air line	Length of route (miles) over Greek territory and territorial waters	No of flights	Miles flown*	Hours flown	Passengers	Mail kg.	Cargo kg
London-Athens-India	British	466	803	374,218	2,475	5,793	1,305,960	183,200
Amsterdam-Athens-Netherlands-East Indies	Dutch	466	323	150,518	969	2,490	137,167	61,950
Berlin-Thessaloniki-Athens	German	289	468	135,225	936	3,435	31,948	14,300
Brindisi-Athens-Rhodes	Italian	466	758	553,523	3,371	4,578	10,490	29,600
Brindisi-Tirana-Thessaloniki	Italian	106	241	25,427	120	418	834	6,100
Marseilles-Athens-Indo-China	French	466	138	64,312	552	803	23,806	20,400
Warsaw-Thessaloniki-Athens	Polish	466	261	121,229	783	1,503	11,406	11,100
Belgrade-Thessaloniki	Jugoslav	43	42	1,827	28	35	174	—

Source: *Annuaire statistique de la Grèce*, 1939, p 260 (Athènes, 1940).

* The number of miles flown is not necessarily the sum of the number of flights and the length of route, because the same route may not always be followed.

Aeropout (Jugoslav National Air Transport Company)
One line: Skoplje—Thessaloníki (Sédhes).

These air lines varied from daily (excepting Sundays) to weekly services. The majority of the routes were in operation all the year round, but those to Central Europe were run irregularly in winter. The Skoplje-Thessaloníki service was suspended during the winter months and ran only from 1 May to 31 August. The traffic along the various routes over Greece in 1938 is shown in the table on p. 393. The figures for the two British air lines crossing Greece are presumably grouped together in this table as they follow the same course to Alexandria. The same probably applies to the two German lines, though these do not follow precisely the same route across Greece. All the figures include transit traffic.

Civil Airfields

There are eight airports for which traffic figures are available, as shown in the table on p. 395.

The Dhekélia (Tatóï) airport, 8 miles north-north-east of Athens, handled the most passengers and mails. The Fáliron base on Fáliron Bay, 4 miles south-west of Athens, was used by *Imperial Airways* Empire flying-boats and *Ala Littoria* aircraft. The Néa Péramos seaplane station (also known as Megálo Pévko), situated 16 miles to the west of Athens on the western shores of the Gulf of Elevsís, was used instead of Fáliron Bay when southerly winds caused bad weather conditions there. It was also the calling place for *Air France* planes on the Far East service, and it was linked with Athens by special bus service. This airport handled the largest amount of incoming and outgoing cargo.

The customs airfields of Greece are: Athens (Dhekélia), Thessaloníki (at Sédhes, 11 miles south-east of the city) and Ioánnina. Customs seaplane stations are established at: Athens (Fáliron), Athens (Néa Péramos), Thessaloníki (at Míkra, 5 miles south of the city), Kérkira, Pátrai, Merabéllo (Kríti), Iráklion, Mitilíni and Síros. Emergency landing grounds are situated at Almirós, Atalándi, Gorgópi, Katerini, Lamía, Mesolóngion and Tanágra. There are several ports, roadsteads and bays suitable for use by seaplanes as emergency landing areas.

Traffic at Airports, 1938

Airport	Passengers			Mail—kg.			Cargo—kg.		
	Arrived Departed	Transit	Total	Arrived Departed	Transit	Total	Arrived Departed	Transit	Total
Athens—Dhekélia	11,672	4,255	15,927	46,241	171,454	217,695	245,400	70,400	315,800
Athens—Fáliron	1,492	5,923	7,415	25,224	1,115,625	1,140,849	26,000	160,800	186,800
Athens—Néa Péramos	484	1,413	1,897	3,999	1,556,548	1,560,547	1,063,900	34,300	1,098,200
Thessaloníki	5,020	7,762	12,782	11,072	62,221	73,293	169,000	82,000	251,000
Ioánnina	2,896	—	2,896	2,582	—	2,582	38,500	—	38,500
Agrínion	773	—	773	285	—	285	17,700	—	17,700
Kérkira	220	1,136	1,356	949	—	949	9,900	33,000	42,900
Dráma	1,016	—	1,016	654	—	654	21,600	—	21,600

Source: *Annuaire statistique de la Grèce*, 1939, p 262 (Athènes, 1940).

Appendix III

POSTS, TELEGRAPHS AND TELEPHONES

Postal Services: Telegraphs Telephones Broadcasting: Special Radio Services: Note on Time

The administration of the postal services and of the state-owned telegraph and telephone systems has been combined since 1887 in the P.T.T. Section of the Ministry of Communications. International telegraph services and some inter-island services by cable are operated by the *Eastern Telegraph Company*, a subsidiary of the British *Cable and Wireless Ltd.* Telephonic communications are maintained partly by the state, and partly by the Hellenic Telephone Company (*A.E.T.E.*) under contract to the government. Broadcasting is under the Radio Broadcasting Service, which is controlled by the state; a contract for further radio development was granted in 1938 to the German *Telefunken* company. Special radio services are maintained by the state and by Greek and foreign air line companies.

In 1938, there were in operation 5,423 'bureaux' of the P.T.T., including central and regional stations and exchanges, post offices, radio-telegraphic stations, customs stations for postal packets, travelling post offices, etc. The P.T.T. personnel numbered 6,725, of whom 225 were concerned with the central administration.

Postal Services

The Greek postal services were inaugurated by a decree of the Capodistrias government in 1828, which instituted four post offices at Epídhavros, Trípolis, Árgos and Síros. Since 1887 the general direction of the postal services has been under the P.T.T. in Athens; regional centres are at Thessaloníki, Pátrai, Ioánnina, Dráma, Kaválla, Lárisa, Trípolis, Mitilíni and in Krítι. In 1938, there were 1,385 post offices, each serving on an average 5,063 people. The average number of people served by each post office, however, varies considerably in each *nomós*; in Fthiótis-Fokís, for example, 96 offices each served 2,254 people, whereas in Kaválla there were 8 offices

each serving 17,144 people. In addition, there were 4,405 public letter boxes and 2,186 private boxes.

The collection and distribution of mail is adequate for the country, although not always rapid. While trains are, of course, used to convey mails wherever possible, large areas of the country are some distance from railways, and an elaborate system of 900 miles of postal routes has been developed. On these routes transport is by post-auto, by mounted courier, or on foot, as shown in the following table for the years 1937 and 1938; figures for 1922 and 1933 are added for comparison:

Year	By post-auto		On horseback		On foot		Mixed		Total	
	No. of routes	Length of routes served (miles)	No. of routes	Length of routes served (miles)	No. of routes	Length of routes served (miles)	No of routes	Length of routes served (miles)	No of routes	Length of routes served (miles)
1922	60	1,327	233	3,935	144	1,299	261	487	698	7,048
1933	182	3,065	222	3,751	275	1,533	211	447	890	8,796
1937	205	4,128	212	2,673	374	1,357	75	494	866	8,652
1938	208	4,303	198	2,551	398	1,476	53	280	857	8,610

Source *Annuaire statistique de la Grèce*, 1931, p 258 (Athènes, 1932); and *ibid.* 1938, p 270, *ibid.* 1939, p. 265.

As might be expected, the length of route served on horseback and on foot has shown some decrease in recent years, while that served by post-auto has increased.

In the most remote areas, where there are no post offices, the needs of the population are met by a rural postal service. A postal official for each district is responsible for the periodic collection and delivery of letters in the villages within his area. In 1938, there were 911 such rural circuits, serving 9,431 villages with a total population of some 2,750,000.

The table on p. 398 summarizes the operation of the postal service in recent years with figures for 1901 and 1922 added for comparison.

Air Mails

A certain amount of both internal and international mail is carried by air; in 1938, the number of items totalled 2,846,292, of which 335,569 were between points within Greece.

Greek Postal Traffic, 1933–8

Year	Letters (1,000)				Parcels (1,000)			
	Inland despatches	Foreign		Total	Inland despatches	Foreign		Total
		Despatches	Arrivals			Despatches	Arrivals	
1901	13,343	6,037	4,481	23,861	227	7	36	270
1922	58,825	14,485	19,376	92,686	412	14	81	507
1933	96,061	13,126	16,578	125,765	525	17	61	603
1934	100,881	13,806	16,954	131,641	524	17	73	614
1935	102,784	14,231	17,161	134,175	476	14	70	560
1936	103,604	14,329	17,236	135,169	491	12	70	573
1937	102,509	13,751	16,321	132,581	515	12	68	595
1938	100,019	13,168	15,464	128,651	561	11	66	638

Source *Annuaire statistique de la Grèce*, 1931, pp. 259–60 (Athènes, 1932); *ibid.*, 1938, p 271; *ibid* 1939, p 266.

The internal air lines (*E.E.E.C.*, see p. 390) carried a certain amount of mail. Figures for 1938 are as follows:

Route	Length (miles)	Mail (kg)
Athens-Thessaloníki	230	4,080
Athens-Dráma	317	659
Thessaloníki-Dráma	87	152
Athens-Ioánnina	230	2,668
Athens-Agrínion	146	212
Agrínion-Ioánnina	84	15

Source: *Annuaire statistique de la Grèce*, 1939, pp 259–60 (Athènes, 1940)

Air mail was also carried between Greece and other countries by the British *Imperial Airways Ltd.* (*B.O.A.C.*), by the Dutch *K.L.M.*, by *Air France* and by the Italian *Ala Littoria*. Foreign air mails totalled 2,510,723 items in 1938, a considerable rise compared with the 1,795,000 of 1937. Some 640,000 items were despatched, 814,000 were received, and 1,055,000 passed through in transit. The table on p. 399 analyses the various countries with which Greece had correspondence by air mail in 1938.

Other Postal Services

The postal service operate a saveings bank (*Caisses d'épargne postales*) (see p. 181), and issues internal postal- and money-orders (*mandats*). The number of internal postal-orders rose from 1·3

		Despatched	Received
Europe		372,294	496,028
of which	France	46,904	48,282
	Germany	115,232	150,449
	Great Britain	56,563	27,209
	Italy	42,302	63,232
	Netherlands	11,180	102,037
	Roumania	19,175	14,677
Africa		160,251	208,130
of which	Egypt	127,816	156,611
America		52,273	25,740
of which	U S A.	47,476	15,171
Asia		41,581	62,556
of which	Palestine	14,716	36,621
Australia and Oceania		14,469	21,697
	Total	640,868	814,151

Source. *Annuaire statistique de la Grèce*, 1939, pp. 261–2 (Athènes, 1940).
Note: This table does not include the 1,055,000 items in transit.

millions in 1934 to 1·7 millions in 1938. Some 34,000 foreign money orders were cashed in Greece in 1938, but none was issued within the country during the years 1933–8.

TELEGRAPHS

The public telegraph service was inaugurated in 1859, when three telegraph stations were installed. By 1880, the number of stations had grown to 86, by 1910 to 620, and by 1930 to 3,452. In 1938, there were 5,423 telegraph offices in operation This figure included those offices equipped for the receipt and despatch of telegraphic messages over telephone wires to the nearest telegraph instrument, of which there were 899 in 1938. Each office served on an average 1,293 people; their distribution, however, varied considerably in each *nomós*, from 173 offices in Rethímni, each serving 436 people, to 142 in Thessaloníki, each serving 3,743. In 1938, there were 14,355 miles of overland telegraph lines, with a total length of 36,738 miles of wire. Most of these wires were overhead.

Submarine Cables

Considerable lengths of submarine cables have been laid to provide telegraphic communication between the Greek mainland and the islands, and between Greece and other countries. Sixty-five internal cables (i.e. those between various parts of Greece) with a total length of 807 nautical miles are owned and operated by the government,

although they were laid originally by the *Eastern Telegraph Company*, and, in fact, are still maintained by them. A further 3,720 nautical miles of cable are directly owned and operated by the *Eastern Telegraph Company*; of this total, 1,699 nautical miles run between points on the Greek coast, while the remainder are international cables. The following tables list (1) the cables owned by the government and (2) those owned by the *Eastern Telegraph Company*.

(1) *Government Cables*

Between		Date of opening	No of conductors	Length (nautical miles)
Mítika	Kálamos	1915	1	0 946
Préveza	Áktion	1914	7	0 350
Mainland	Levkás	1912	8	0 016
Ríon (Pátrai)	Andírrion (Návpaktos)	1870	1	1·293
Ríon (Pátrai)	Andírrion (Návpaktos)	1891	1	1·293
Ríon (Pátrai)	Andírrion (Návpaktos)	1913	1	1 272
Ríon (Pátrai)	Andírrion (Návpaktos)	1915	1	1 272
Ríon (Pátrai)	Andírrion (Návpaktos)	1915	1	1 272
Ríon (Pátrai)	Andírrion (Návpaktos) (No 2)	1891	1	1 337
Galatá	Póros	1884	1	0 152
Galatá	Póros	1888	1	0·096
Galatá	Póros	1912	1	0 099
Across the swing bridge to Évvoia		1897	1	0 210
Across the swing bridge to Évvoia		1910	3	0·248
Stilís	Mólos	1910	2	1·590
Áyios Dhimítrios	Oreoí (Évvoia)	1881	1	3 673
Artemísion (Évvoia)	Skíathos	1881	1	7 814
Lávrion	Kéa	1881	1	16 120
Kaválla	Thásos	1907	1	5·027
Neápolis	Kíthira	1881	1	9·484
Khíos	Plomárion (Lésvos)	1913	1	46 582
Khíos	Oinsúsai	1913	1	7 331
Sámos	Ikaría	1920	1	11 880
Khíos	Sámos	1914	1	65 499
Ikaría	Míkonos	1920	1	26 436
Mílos	Kímolos	1906	1	1 366
Rafína	Fígon (Évvoia)	1879	1	13 690
Oropós	Erétria (Évvoia)	1891	1	4 150
Vathí	Tríkeri	1884	1	5 030
Skíathos	Skópelos	1884	1	7 700
Kími (Évvoia)	Skíros	1885	1	24 940
Káristos (Évvoia)	Ándros	1873	1	9·300
Ándros	Tínos	1873	1	1 770
Tínos	Míkonos	1884	1	5 970
Míkonos	Rinía (Dhílos)	1884	1	5 100
Tínos	Síros	1873	1	12 490
Síros	Páros	1884	1	24 290
Páros	Náxos	1884	1	4·870
Náxos	Amorgós	1884	1	22·920
Náxos	Íos	1884	1	12 580
Íos	Thíra	1884	1	12 640

(1) *Government Cables*—continued

Thíra	Anáfi	1885	1	16 800
Íos	Síkinos	1885	1	6 780
Síkinos	Folégandros	1885	1	8 960
Páros	Sífnos	1884	1	21 820
Sífnos	Mílos	1884	1	19·830
Sífnos	Sérifos	1884	1	11·340
Sérifos	Kíthnos	1884	1	15 360
Kíthnos	Kéa	1884	1	9 320
Piraiévs	Aíyina	1884	1	12·490
Aíyina	Méthana	1884	1	4·420
Méthana	Póros	1884	1	4·010
Metókhi	Ídhra	1873	1	4 510
Kranídhion	Spétsai	1869	1	2·270
Katákolon	Zákinthos	1884	1	25·070
Tripití	Zákinthos	1870	1	10 930
Zákinthos	Kefallinía	1869	1	19·440
Lixoúrion (Kefallinía)	Argostólion (Kefallinía)	1885	1	2 320
Kefallinía	Itháki	1869	1	6 500
Itháki	Levkás	1870	1	7·020
Levkás	Kérkira	1884	1	43·650
Kérkira	Paxoí	1884	1	12·530
Zákinthos	Khaniá	1873	1	255·418
Kástron (Límnos)	Thessaloníki	1884	1	139·530

Source. *Nomenclature des câbles formant le réseau sous-marin du globe*, pp 23–4, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1939)

(2) *Eastern Telegraph Company Cables*

Between		Date of opening	No of conductors	Length (nautical miles)
Malta	Zákinthos	1887	1	404 400
Zákinthos	Kérkira	1871	1	145·873
Kérkira	Otranto (Italy)	1882/1918/1920	1	63 552
Alexandria	Iráklion	1871/1873/1933	1	418·876
Zákinthos	Pátrai (No 1)	1884	1	55 354
Zákinthos	Pátrai (No 2)	1887	1	57 852
Zákinthos	Pátrai (No. 3)	1901	1	55 371
Pátrai	Kórinthos (No 1)	1884	1	72 500
Pátrai	Kórinthos (No 2)	1889	1	73 045
Pátrai	Kórinthos (No 3)	1901	1	71 471
Kalamáki	Piraiévs (No. 1)	1884	1	30 566
Kalamáki	Piraiévs (No 2)	1889	1	31 059
Kalamáki	Piraiévs (No. 3)	1901	1	32 641
Piraiévs	Síros (No. 1)	1884	1	82 113
Piraiévs	Síros (No 2)	1894	1	83 583
Piraiévs	Síros (No 3)	1901	1	87 986
Piraiévs	Khíos (No 1)	1873	1	92 402
Síros	Khíos (No. 2)	1885	1	89 619
Khíos	Thessaloníki	1915/1934	1	261 121
Síros	Iráklion (Kríti)	1878	1	136 958

Source *Nomenclature des câbles formant le réseau sous-marin du globe*, p 45, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1939)

Operation of the Telegraphic Service

The following table summarizes the operation of the telegraphic service (excluding radio-telegraphy) during the years 1933–8; the figures for 1901 and 1922 are added for comparison (1,000 telegrams):

Year	Transmitted to points within Greece	Transmitted to other countries	Received from other countries	Total
1901	984	112	109	1,205
1922	4,373	434	425	5,232
1933	3,887 8	291 7	369 3	4,548 8
1934	4,023 9	294 9	331 6	4,650·4
1935	4,463 5	307 4	332 0	5,102 9
1936	4,644 2	293 6	324 4	5,262 2
1937	4,671·7	297 6	341 6	5,310 9
1938	4,783 8	291 2	342·9	5,417 9

Source *Annuaire statistique de la Grèce*, 1931, p 262 (Athènes, 1932); *ibid.* 1939, p. 267 (Athènes, 1940).

Radio-telegraphy

Radio-telegraphic services are carried out by four coastal radio stations, situated at Athens, Khíos, Kérkira and the Isthmus of Kórinthos. The first three are open for the exchange of service and public radio-telegrams between ships of any nationality and Greek telegraph offices, the fourth communicates with ships solely for the preparation of their entry into the Kórinthos Canal. The station at Athens is by far the most important; it has a daytime range of some 800 miles and is linked by direct land-line with the telegraph offices at Athens and Piraiévs. The increasing number of public radio-telegrams handled in recent years by the coastal stations is shown in the following table:

Year	Received from Greek ships	Received from foreign ships	Transmitted from Greece	Total
1926	3,105	3,120	1,935	8,160
1933	10,023	5,475	1,392	16,890
1934	10,580	5,723	992	17,295
1935	10,845	5,120	2,083	18,048
1936	10,216	5,460	3,256	18,932
1937	13,032	6,998	2,308	22,338
1938	14,193	6,800	3,710	24,703

Source. *Annuaire statistique de la Grèce*, 1931, p. 263 (Athènes, 1932); *ibid.* 1939, p. 263 (Athènes, 1940).

Telephones

Telephonic communications are maintained partly by the state and partly by the *A E T.E.* (Hellenic Telephone Company). The *A.E.T.E.* runs the automatic telephone system in the larger towns and also maintains direct telephonic communication with other parts of continental Europe. This company is under the control of *Siemens und Halske A.-G.* (Berlin), which installed the system in 1931, and subsequently supplied material and technical advisers. The government appoints one representative to the board of directors of this company. In 1930, when the whole system was rather inadequately state-operated, there were only 8,473 subscribers in the whole country with 14,695 installed telephones. By 1938, the number of subscribers had increased to 38,257, with 43,596 installed telephones; these included a considerable number of party and omnibus lines. Three cities, Athens, Thessaloníki and Piraiévs, each had over 5,000 subscribers. The length of line in 1938 totalled 726 miles with 129,144 miles of wire; 126 miles of line were carried in underground tubes, most of this being in Athens and Thessaloníki, while 95 miles were laid in underground armoured cables and 501 miles as overhead wires. The system operated on thirty-four exchanges, of which seventeen were in Athens; it was reported to be extremely efficient and its equipment in excellent condition in 1939.

The state operates the manual system in the smaller towns and country districts, and also the inter-urban connexions. Most villages, even small ones, are connected to the system, which consisted of eight central stations and 230 minor exchanges. The total number of state-owned telephones in 1938 was only 6,273, or less than one-seventh of those installed by the *A E.T.E.*; further, more than five-sixths of these were public instruments at post offices. This system was reported to be rather primitive and not very efficient. In 1938, the state system consisted of 6,919 miles of line, with a total of 20,965 miles of wire; most of these wires were overhead. There were also five state-owned telephone submarine cables as shown in the table on p. 404. There were no radio-telephonic services in operation in Greece.

Between		Date opened	Conductors	Length (naut miles)
Kérkira	Quarantine Is	1912	1×2	0 701
Levkás	Meganísi	1924	1	1 132
Pérama	Návstathmos (Salamís)	1914	10×2	1 024
Pérama	Áyios Yeóryios	1911	2×2	0 755
Páros	Kímolos	1906	1	1 366

Source *Nomenclature des câbles formant le réseau sous-marin du globe*, pp 23–4, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1939).

Broadcasting

In 1939, there was only one important broadcasting station in Greece. This was owned by the state and was operated in Athens by the Radio Broadcasting Service. Although concessions for a broadcasting station were granted in 1926, it was not until ten years later that any active steps were taken to inaugurate a service. Regular transmissions began from the Athens station in 1938, operating on a frequency of 601 kc/s, wave-length 499 1 metres, and a power of 15 kW. There were three transmitters, one for medium-wave transmission (499·1 metres) at Néa Liósia, a suburb of Athens, and two at Harváti, 10 miles north-east of Athens; of the latter, one was used for medium-wave transmission (499·1 metres) and the other for short-wave transmission with wave-lengths of 21·99 metres (13,640 kc/s) and 47 9 metres (6,318 kc/s). The Radio Broadcasting Service was placed under the control of the Under-Secretariat for Press and Tourism, and was administered by a Board of Governors consisting of the Under-Secretary of State for Communications as chairman and of four other members appointed by him.

In 1938 the German *Telefunken* Company was granted a twenty-five years' concession to build and operate broadcasting stations in Greece. The Athens station was to be replaced by a more powerful 100-kW. transmitter, and two new stations with medium-wave transmitters were to be installed—at Thessaloníki (15 kW.) and at Kérkira (5 kW.). At the end of five years, the control of these transmitters was to pass exclusively to the state. The Thessaloníki station has been established with a frequency of 804 kc/s and a wave-length of 373 1 metres. Provision was also made for the erection of a short-wave transmitter at Spárti, with special beam aerials for transmissions to the U.S.A. and to Australia. The station came into operation in 1940; it had a power of 10 kW. and its frequencies ranged from 6,885 kc/s to 15,015 kc/s.

Licence figures for receiving sets in operation in Greece rose rapidly from nearly 18,000 in 1937 to 50,900 in 1939; the latter figure, however, represents a proportion of only 6·1 sets per thousand householders, a strikingly low figure even for the Balkans. Before the Athens station began operation, there were only a few listeners with expensive sets capable of receiving foreign broadcasts. Greece depended mainly on imported receivers; in 1939, about one-half came from America and one-third from Germany, while most of the so-called 'Greek sets' were assembled within the country from imported foreign parts. Cheap 'people's sets' have been introduced in order to popularize broadcasting, but the varying electrical voltage from place to place and the absence of electricity in many districts are disadvantages.

Special Radio Services

Small transmitting stations for special services consist of (1) aircraft radio stations, (2) aeronautical stations; (3) fixed stations; and (4) coastal radio stations. The last consist of radio-telegraphic transmitters, and are described on p. 402.

(1) *Aircraft Radio Stations*

The following radio stations installed in aircraft were in operation in 1939:

Name of station or mark of nationality and registration	Call sign	Frequencies kc/s	Type of emission	Power in the aerial kW.
Thessaloníki	SXACB	333	A1, A2, A3	0 022
Athens	SXACA	333	A1, A2, A3	0 022
Ioánnina	SXACD	333	A1, A2, A3	0 022
Pátrai	SXACE	333	A1, A2, A3	0 022
SX-ACF	SXACF	272	A1, A2, A3	0 07
SX-ACH	SXACH	272	A1, A2, A3	0 07
SX-ACI	SXACI	272	A1, A2, A3	0 07
Aéronef de guerre hellénique	SXKAB	333	A1	—

Source: *Nomenclature des Stations Aéronautiques et d'Aéronef*, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1939)

The three types of emission in use in 1939 were as follows, with the definitions quoted in the *Nomenclature des Stations Aéronautiques et d'Aéronef*, p. iv, published by the *Bureau de l'Union Internationale des Télécommunications*.

Type A.1. Telegraphy on pure continuous waves. A continuous wave which is keyed according to a telegraph code.

Type A.2. Modulated telegraphy. A carrier wave modulated at one or more audible frequencies, the audible frequency or frequencies or their combination with the carrier wave being keyed according to a telegraph code.

Type A.3. Telephony. Waves resulting from the modulation of a carrier wave by frequencies corresponding to the voice, to music or to other sounds.

(2) *Aeronautical Stations*

The following aeronautical stations were in operation in 1939:

Station	Call sign	Transmission		Reception		Power in the aerial kW.
		Frequency kc/s	Type	Frequency kc/s	Type	
Agrínion Aeradio	SWD	336	A1	250–500	A1, A2	0 002
Athens–Fáliron Aeradio SWF	SWF	260, 284, 336	A1	250–500	A1, A2	0 15
Athens–Fáliron Aeradio SWZ	SWZ	4,286, 4,687 5, 5,660, 6,522, 8,333, 12,500	A2	Similar to transmission	A2	0 3
Ioánnina Aeradio	SWE	336	A1	250–500	A1, A2	0 002
Kérkira Aeradio	SWK	260, 333, 5,454, 8,333, 11,538	A1	175–14,286	A1	0 2
Néa Péramos Aeradio	SWG	260, 333, 5,454, 8,050 11,538	A1	175–14,286	A1	0 2
Palaión Fáliron Aeradio	SWL	4,688–6,522	A1	14,045–15,480	A1	0 25–0 3
Thessaloníki Aeradio	SWC	260, 284, 336	A1, A2	50–500	A1, A2	0 45

Source: *Nomenclature des Stations Aéronautiques et d'Aéronef*, p. 125, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1939)

Stations SWF, SWZ and SWC are equipped with direction-finding apparatus. Stations SWF and SWZ are intended to serve the airports in the region of Athens, namely Dhekélia, Fáliron and Néa Péramos. Station SWL is owned by the Italian company *Ala Littoria* to serve its own aircraft, and stations SWK and SWG are similarly owned by *Air France*.

(3) *Fixed Stations*

The following fixed radio stations were in operation in 1938:

Station	Call sign	Wave	
		Frequency kc/s	Length (metres)
Alexandroúpolis	SXD	375	800
Alexandroúpolis	SXD	425	706
Alexandroúpolis	SXD	500	600
Khaniá	SXN	375	800
Khaniá	SXN	425	706
Khaniá	—	443	677
Khaniá	SXN	500	600
Kérkira (Corfu)	SXK	375	800
Kérkira	SXK	425	706
Kérkira	—	472	636
Kérkira	SXK	500	600
Ríon	SXX	500	600
Samothráki	SXR	400	750
Thessaloníki	SXC	375	800
Thessaloníki	SXC	425	706
Thessaloníki	SXC	500	600

Source *Nomenclature des Stations Fixes*, p. 138, published by the *Bureau de l'Union internationale des Télécommunications* (Berne, 1938).

Note on Time

The standard time kept in Greece is that of the 30°E. meridian, that is, two hours ahead of G.M.T.; various changes have, however, been introduced since 1941. On 5–6 April 1941 one hour of Summer Time (three hours ahead of G M.T) was adopted and in October of that year the time reverted to Winter Time (two hours ahead of G.M.T.). On 2 November 1942 standard time was altered to one hour in advance of G.M.T., presumably to bring it into line with German and Central European Time. This standard time remained in force until October 1944; on 29 March 1943, one hour of Summer Time was adopted (two hours ahead of G.M.T.) and Winter Time was reverted to on 4 October (one hour ahead of G.M.T.). Again on 3 April 1944 one hour of Summer Time was adopted, and Winter Time was reintroduced on 2 October.

CONVERSION TABLES

Metric and British Units

It is customary to think of the 'metre' and the 'yard' as representing unalterable units of length. This is not so. The metre was originally intended to be the 10,000,000th part of the earth's meridional quadrant. But the accurate determination of this length proved to be extremely difficult—partly for technical reasons, and partly because of different conceptions of the 'figure of the earth'. In view of these difficulties it became necessary to define the length of the metre in terms of suitable metal bars measured under specified conditions of temperature, pressure, humidity, etc. Similar standard bars were also used to define the length of other units such as the yard As all these metallic standards are subject to change, conversion tables differ according to the date of comparison between different bars The tables that follow are based on the comparison between the yard and the metre made in 1895. This made 1 metre equivalent to 39·370113 in

Metric System: List of Prefixes

Deca means ten times.	Deci means a tenth part of
Hecto means a hundred times.	Centi means a hundredth part of.
Kilo means a thousand times	Milli means a thousandth part of.

In abbreviations the Decametre, etc., is Dm., and the decimetre, etc , dm

Note on 'Nautical', 'Geographical' and 'Statute' miles

A British 'nautical mile' is the length of the minute of the meridian at any given latitude, and is therefore a variable unit. It is given in feet for Clarke's 1880 spheroid by the formula

$$60771\ 1 - 30\ 7 \cos 2\ \text{Lat}$$

This is the sea mile of the scale of latitude and distance of the Admiralty Charts From the above formula it will be found to vary from 6,046·4 ft at the equator to 6,107 8 ft. at the poles, being 6,077 1 ft at latitude 45°.

The so-called 'international nautical mile' of 1,852 m or 6,076 ft. is the length of the minute of the meridian at latitude 45° on the international spheroid This corresponds to the 6,077 ft. for Clarke's spheroid

A 'geographical mile' is a fixed unit, being defined by some as the length of a minute of the equator and by others as that of the minute of the meridian at latitude 45° According to the former definition its value on Clarke's spheroid is 6,087 ft and according to the latter 6,077 ft The round figure 6,080 is usually adopted for the purposes of ordinary navigation.

The British 'statute mile' measures 5,280 ft

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Table 1. *Length*

Nautical mile	Statute mile	Kilometre	Metre	Yard	Foot	Inch	Centimetre
1	1·152	1·853	1853	2027	6080*	72,960	185,300
0 8684	*1*	1·60934	1609 34	1760	5280	63,360	160,934
0 5396	0 621372	*1*	1000	1093 61	3280 84	39,370 1	100,000
0 0005396	0 0006214	0·001	*1*	1·09361	3·28084	39 3701	100
0 0004934	0·0005682	0·0009144	0 914399	*1*	3	36	91 4399
0 0001645	0 0001894	0 0003048	0 3048	0 33333	*1*	12	30·48
0 0000137	0 0000158	0·0000254	0·0254	0 02778	0·083333	*1*	2·54
0·0000054	0 0000062	0 00001	0 01	0 0109361	0 032808	0 393701	*1*

* This is the customary British practice, and not the 'international nautical mile,' which Great Britain has not adopted.

Table 2. *Area*

Square mile	Square kilometre	Hectare	Acre	Square metre	Square yard
1	2·58998	258 998	640	2,589,980	3,097,600
0 386103	*1*	100	247 106	1,000,000	1,195,090
0·003861	0 01	*1*	2 47106	10,000	11,959 9
0·0015625	0 0040469	0 404685	*1*	4046 85	4840
0 00000039	0 000001	0 0001	0 000247	*1*	1 19599
0 00000032	0 00000084	0 0000836	0·000207	0 836126	*1*

Table 3. *Yield per Unit Area*

Tons per acre	Metric tons per hectare	Quintals per hectare
1	2 51071	25 1071
0 398294	*1*	10
0 0398294	0 1	*1*

Table 4. *Volume and Capacity*

Kilolitre	Cubic metre	Cubic yard	Bushel	Cubic feet	Imp. gall	Litre	Pint
1	1 000027	1 30799	27 4969	35 3157	219 976	1000	1759 80
0 999973	*1*	1 30795	27 4962	35 3148	219 970	999·973	1759·75
0 764532	0 764553	*1*	21·0223	27	168 178	764 532	1345 43
0·0363677	0 0363687	0 0475685	*1*	1 28435	8	36 3677	64
0·028316	0 028317	0 037037	0 778602	*1*	6 22882	28 3160	49 8306
0 0045460	0 0045608	0 0059461	0·125	0·160544	*1*	4 54596	8
0·001	0 001000	0 001308	0 027497	0 035316	0 219976	*1*	1 75980
0 0005682	0 0005683	0 0007433	0 015625	0 020068	0·125	0 56824	*1*

Table 5. *Weight*

Ton	Metric ton or millier	Quintal	Kilogram	Pound
1	1 01605	10 1605	1016·05	2240
0 984207	*1*	10	1000	2204·62
0 0984207	0 1	*1*	100	220 462
0 0009842	0 001	0 01	*1*	2·20462
0 0004464	0 0004536	0 004536	0 453592	*1*

Table 6. *Temperature : Equivalents of Fahrenheit and Centigrade Scales*

°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C.	°F.	°C
100	37 7	79 25	26 25	58	14·4	37·4	3	17	− 8·3	− 4	−20
99·5	37·5	79	26·1	57·2	14	37	2·7	16·25	− 8·75	− 5	−20·5
99	37·2	78·8	26	57	13·8	36·5	2·5	16	− 8 8	− 5·8	−21
98 6	37	78	25 5	56 75	13 75	36	2 2	15 8	− 9	− 6	−21 1
98	36·6	77	25	56	13 3	35 6	2	15	− 9·4	− 6 25	−21·25
97·25	36 25	76	24·4	55·4	13	35	1·6	14	−10	− 7	−21·6
97	36·1	75 2	24	55	12 7	34·25	1·25	13	−10·5	− 7·6	−22
96·8	36	75	23 8	54·5	12·5	34	1·1	12·2	−11	− 8	−22 2
96	35·5	74 75	23 75	54	12·2	33 8	1	12	−11 1	− 8 5	−22 5
95	35	74	23·3	53 6	12	33	0·5	11·75	−11·25	− 9	−22·7
94	34·4	73 4	23	53	11 6	32	0	11	−11·6	− 9·4	−23
93·2	34	73	22 7	52 25	11 25	31	− 0·5	10·4	−12	−10	−23·3
93	33·8	72·5	22 5	52	11·1	30 2	− 1	10	−12·2	−10 75	−23·75
92·75	33 75	72	22·2	51·8	11	30	− 1·1	9·5	−12·5	−11	−23 8
92	33·3	71 6	22	51	10 5	29 75	− 1 25	9	−12·7	−11·2	−24
91 4	33	71	21 6	50	10	29	− 1·6	8 6	−13	−12	−24·4
91	32 7	70 25	21 25	49	9 4	28·4	− 2	8	−13 3	−13	−25
90·5	32·5	70	21·1	48 2	9	28	− 2·2	7 25	−13·75	−14	−25 5
90	32 2	69 8	21	48	8 8	27 5	− 2·5	7	−13 8	−14 8	−26
89 6	32	69	20 5	47 75	8·73	27	− 2·7	6·8	−14	−15	−26·1
89	31 6	68	20	47	8·3	26 6	− 3	6	−14·4	−15 25	−26 25
88 25	31·25	67	19·4	46·4	8	26	− 3·3	5	−15	−16	−26 6
88	31·1	66 2	19	46	7 7	25·25	− 3·75	4	−15·5	−16 6	−27
87 8	31	66	18 8	45·5	7 5	25	− 3·8	3·2	−16	−17	−27·2
87	30 5	65·75	18·75	45	7·2	24·8	− 4	3	−16·1	−17·5	−27·5
86	30	65	18 3	44 6	7	24	− 4·4	2·75	−16 25	−18	−27 7
85	29 4	64·4	18	44	6 6	23	− 5	2	−16·6	−18·4	−28
84·2	29	64	17 7	43 25	6·25	22	− 5·5	1·4	−17	−19	−28 3
84	28·8	63·5	17 5	43	6·1	21·2	− 6	1	−17 2	−19 75	−28·75
83·75	28·75	63	17·2	42·8	6	21	− 6·1	0 5	−17 5	−20	−28 8
83	28 3	62 6	17	42	5 5	20·75	− 6·25	0	−17·7	−20 2	−29
82·4	28	62	16 6	41	5	20	− 6·6	− 0·4	−18	−21	−29 4
82	27·7	61·25	16·25	40	4 4	19·4	− 7	− 1	−18 3	−22	−30
81·5	27·5	61	16·1	39·2	4	19	− 7·2	− 1·75	−18·75	−23	−30·5
81	27·2	60 8	16	39	3·8	18·5	− 7·5	− 2	−18·8	−23·8	−31
80 6	27	60	15·5	38·75	3·75	18	− 7·7	− 2·2	−19	−24	−31·1
80	26·6	59	15	38	3·3	17·6	− 8	− 3	−19·4	−24·25	−31·25

Table 7. *Pressure : Equivalents of Millibars, Millimetres of Mercury, and Inches of Mercury at 32° F. in Latitude 45°*

Mercury in.	Millibars	Mercury mm	Mercury in.	Millibars	Mercury mm	Mercury in	Millibars	Mercury mm	Mercury in.	Millibars	Mercury mm	Mercury in	Millibars	Mercury mm
27 02	915	686 3	27 82	942	706·6	28 62	969	726 8	29 41	996	747 1	30 21	1,023	767·3
27 05	916	687 1	27 85	943	707·3	28 65	970	727 6	29 44	997	747 8	30 24	1,024	768 1
27·08	917	687 8	27 88	944	708 1	28 67	971	728 3	29 47	998	748 6	30 27	1,025	768 8
27.11	918	688 6	27 91	945	708 8	28 70	972	729 1	29 50	999	749·3	30 30	1,026	769 6
27.14	919	689 3	27 94	946	709 6	28 73	973	729·8	29 53	1,000	750 1	30 33	1,027	770 3
27·17	920	690 1	27 97	947	710 3	28 76	974	730·6	29 56	1,001	750 8	30·36	1,028	771 1
27 20	921	690 8	28 00	948	711·1	28 79	975	731·3	29·59	1,002	751·6	30 39	1,029	771 8
27 23	922	691 6	28·03	949	711 8	28 82	976	732·1	29 62	1,003	752 3	30 42	1,030	772 6
27 26	923	692 3	28 05	950	712 6	28 85	977	732·8	29 65	1,004	753·1	30 45	1,031	773·3
27·29	924	693 1	28 08	951	713 3	28 88	978	733 6	29 68	1,005	753 8	30 48	1,032	774 1
27·32	925	693 8	28·11	952	714 1	28 91	979	734 3	29 71	1,006	754 6	30 51	1,033	774 8
27·35	926	694 6	28 14	953	714·8	28 94	980	735·1	29 74	1,007	755 3	30 53	1,034	775·6
27 38	927	695 3	28·17	954	715 6	28 97	981	735 8	29·77	1,008	756 1	30 56	1,035	776 3
27 41	928	696 1	28 20	955	716·3	29 00	982	736·6	29 80	1,009	756·8	30 59	1,036	777 1
27 44	929	696 8	28 23	956	717 1	29 03	983	737·3	29·83	1,010	757 6	30·62	1,037	777 8
27 46	930	697 6	28 26	957	717 8	29 06	984	738 1	29 86	1,011	758 3	30 65	1,038	778·6
27 49	931	698·3	28 29	958	718 6	29 09	985	738·8	29 89	1,012	759 1	30 68	1,039	779 3
27·52	932	699 1	28 32	959	719 3	29 12	986	739 6	29·92	1,013	759 8	30 71	1,040	780 1
27 55	933	699 8	28 35	960	720 1	29 15	987	740·3	29 94	1,014	760 6	30 74	1,041	780 8
27 58	934	700 6	28 38	961	720 8	29 18	988	741 1	29 97	1,015	761 3	30 77	1,042	781 6
27 61	935	701 3	28 41	962	721 6	29·21	989	741 8	30 00	1,016	762·1	30 80	1,043	782·3
27 64	936	702 1	28 44	963	722 3	29 24	990	742·6	30 03	1,017	762 8	30 83	1,044	783 1
27 67	937	702 8	28 47	964	723 1	29 26	991	743 3	30·06	1,018	763 6	30 86	1,045	783 8
27 70	938	703 6	28·50	965	723 8	29 29	992	744 1	30·09	1,019	764 3	30 89	1,046	784·6
27 73	939	704 3	28 53	966	724 6	29 32	993	744 8	30 12	1,020	765 1	30 92	1,047	785 3
27 76	940	705 1	28 56	967	725 3	29 35	994	745 6	30·15	1,021	765 8	30 95	1,048	768 1
27·79	941	705 8	28 59	968	726 1	29 38	995	746 3	30·18	1,022	766 6	30 98	1,049	786·8

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